TREE OF LIFE | VAMPIRE GRAVES? | JUDGE JONES SPEAKS OUT | CURIOUS CONTRAILS

Skeptical Inquirer

THE MAGAZINE FOR SCIENCE AND REASON
Volume 33, No. 1 • March / April 2009 • INTRODUCTORY PRICE U.S. and Canada $4.95

DEBUNKING THE PEARL HARBOR MESSAGE MYTH

Science and Antiscience in America: Why It Matters

Science, Reason, and Obama

Open Mindedness: What It Requires

Deep History or Shallow Cognition

Saturn's Moon Enceladus: Habitable?

Published by the Committee for Skeptical Inquiry

04
0 71486 02614 3

COMMITTEE FOR SKEPTICAL INQUIRY

FORMERLY THE COMMITTEE FOR THE SCIENTIFIC INVESTIGATION OF CLAIMS OF THE PARANORMAL (CSICOP)
AT THE CENTER FOR INQUIRY/TRANSNATIONAL (ADJACENT TO THE STATE UNIVERSITY OF NEW YORK AT BUFFALO NORTH CAMPUS)

AN INTERNATIONAL ORGANIZATION

Paul Kurtz, Chairman; professor emeritus of philosophy, State University of New York at Buffalo
Barry Karr, Executive Director
Joe Nickell, Senior Research Fellow
Richard Wiseman, Research Fellow
Massimo Polidoro, Research Fellow
Lee Nisbet, Special Projects Director

FELLOWS

James E. Alcock,* psychologist, York Univ., Toronto
Marcia Angell, M.D., former editor-in-chief, *New England Journal of Medicine*
Stephen Barrett, M.D., psychiatrist, author, consumer advocate, Allentown, Pa.
Willem Betz, professor of medicine, Univ. of Brussels
Irving Biederman, psychologist, Univ. of Southern California
Susan Blackmore, Visiting Lecturer, Univ. of the West of England, Bristol
Henri Broch, physicist, Univ. of Nice, France
Jan Harold Brunvand, folklorist, professor emeritus of English, Univ. of Utah
Mario Bunge, philosopher, McGill University
Sean B. Carroll, professor of molecular genetics, Univ. of Wisconsin–Madison
John R. Cole, anthropologist, editor, National Center for Science Education
Frederick Crews, literary and cultural critic, professor emeritus of English, Univ. of California, Berkeley
Richard Dawkins, zoologist, Oxford Univ.
Geoffrey Dean, technical editor, Perth, Australia
Cornelis de Jager, professor of astrophysics, Univ. of Utrecht, the Netherlands
Daniel C. Dennett, university professor and Austin B. Fletcher Professor of Philosophy, director of the Center for Cognitive Studies at Tufts Univ.
Ann Druyan, writer and producer, and CEO, Cosmos Studios, Ithaca, New York
Kenneth Feder, professor of anthropology, Central Connecticut State Univ.
Antony Flew, philosopher, Reading Univ., U.K.
Barbara Forrest, professor of philosophy, Southeastern Louisiana Univ.
Andrew Fraknoi, astronomer, Foothill College, Los Altos Hills, Calif.
Kendrick Frazier*, science writer, editor, SKEPTICAL INQUIRER
Yves Galifret, executive secretary, l'Union Rationaliste
Martin Gardner, author, critic
Murray Gell-Mann, professor of physics, Santa Fe Institute; Nobel laureate
Thomas Gilovich, psychologist, Cornell Univ.
Henry Gordon, magician, columnist, Toronto
Susan Haack, Cooper Senior Scholar in Arts and Sciences, professor of philosophy and professor of Law, University of Miami
C.E.M. Hansel, psychologist, Univ. of Wales
David J. Helfand, professor of astronomy, Columbia Univ.
Douglas R. Hofstadter, professor of human understanding and cognitive science, Indiana Univ.
Gerald Holton, Mallinckrodt Professor of Physics and professor of history of science, Harvard Univ.
Ray Hyman,* psychologist, Univ. of Oregon
Leon Jaroff, sciences editor emeritus, *Time*
Sergei Kapitza, former editor, Russian edition, *Scientific American*
Lawrence M. Krauss, author and professor of physics and astronomy, Case Western Reserve University
Harry Kroto, professor of chemistry and biochemistry, Florida State University; Nobel laureate
Edwin C. Krupp, astronomer, director, Griffith Observatory
Paul Kurtz,* chairman, Center for Inquiry
Lawrence Kusche, science writer
Leon Lederman, emeritus director, Fermilab; Nobel laureate in physics
Scott Lilienfeld, psychologist, Emory Univ.
Lin Zixin, former editor, *Science and Technology Daily* (China)
Jere Lipps, Museum of Paleontology, Univ. of California, Berkeley
Elizabeth Loftus, professor of psychology, Univ. of California, Irvine
John Maddox, editor emeritus of *Nature*
David Marks, psychologist, City University, London
Mario Mendez-Acosta, journalist and science writer, Mexico City, Mexico
Marvin Minsky, professor of media arts and sciences, M.I.T.
David Morrison, space scientist, NASA Ames Research Center
Richard A. Muller, professor of physics, Univ. of Calif., Berkeley
Joe Nickell, senior research fellow, CSI
Lee Nisbet, philosopher, Medaille College
Bill Nye, science educator and television host, Nye Labs
James E. Oberg, science writer
Irmgard Oepen, professor of medicine (retired), Marburg, Germany
Loren Pankratz, psychologist, Oregon Health Sciences Univ.
Robert L. Park, professor of physics, Univ. of Maryland
John Paulos, mathematician, Temple Univ.
Steven Pinker, cognitive scientist, Harvard
Massimo Polidoro, science writer, author, executive director CICAP, Italy
Milton Rosenberg, psychologist, Univ. of Chicago
Wallace Sampson, M.D., clinical professor of medicine, Stanford Univ., editor, *Scientific Review of Alternative Medicine*
Amardeo Sarma*, senior manager, NEC Europe Ltd.; chairman, GWUP, Germany.
Evry Schatzman, former president, French Physics Association
Eugenie Scott, physical anthropologist, executive director, National Center for Science Education
Robert Sheaffer, science writer
Elie A. Shneour, biochemist, author, president and research director, Biosystems Research Institute, La Jolla, Calif.
Dick Smith, film producer, publisher, Terrey Hills, N.S.W., Australia
Robert Steiner, magician, author, El Cerrito, Calif.
Victor J. Stenger, emeritus professor of physics and astronomy, Univ. of Hawaii; adjunct professor of philosophy, Univ. of Colorado
Jill Cornell Tarter, astronomer, SETI Institute, Mountain View, Calif.
Carol Tavris, psychologist and author, Los Angeles, Calif.
David Thomas, physicist and mathematician, Peralta, New Mexico
Stephen Toulmin, professor of philosophy, Univ. of Southern California
Neil deGrasse Tyson, astrophysicist and director, Hayden Planetarium, New York City
Marilyn vos Savant, *Parade* magazine contributing editor
Steven Weinberg, professor of physics and astronomy, Univ. of Texas at Austin; Nobel laureate
E.O. Wilson, university professor emeritus, Harvard University
Richard Wiseman, psychologist, University of Hertfordshire
Benjamin Wolozin*, professor, department of pharmacology, Boston University School of Medicine
Marvin Zelen, statistician, Harvard Univ.

* Member, CSI Executive Council
(Affiliations given for identification only.)

• • • Visit the **CSI** Web site at www.csicop.org • • •

The SKEPTICAL INQUIRER (ISSN 0194-6730) is published bimonthly by the Committee for Skeptical Inquiry, 3965 Rensch Road, Amherst, NY 14228. Printed in U.S.A. Periodicals postage paid at Buffalo, NY, and at additional mailing offices. Subscription prices: one year (six issues), $35; two years, $60; three years, $84; single issue, $4.95. Canadian and foreign orders: Payment in U.S. funds drawn on a U.S. bank must accompany orders; please add US$10 per year for shipping. Canadian and foreign customers are encouraged to use Visa or MasterCard. Canada Publications Mail Agreement No. 41153509. Return undeliverable Canadian addresses to: IMEX, P.O. Box 4332, Station Rd., Toronto, ON M5W 3J4.

Inquiries from the media and the public about the work of the Committee should be made to Paul Kurtz, Chairman, CSI, P.O. Box 703, Amherst, NY 14226-0703. Tel.: 716-636-1425. Fax: 716-636-1733.

Manuscripts, letters, books for review, and editorial inquiries should be addressed to Kendrick Frazier, Editor, SKEPTICAL INQUIRER, 944 Deer Drive NE, Albuquerque, NM 87122. Fax: 505-828-2080. Before submitting any manuscript, please consult our Guide for Authors for format, references, and submittal requirements. It is on our Web site at www.csicop.org/si/guide-for-authors.html and on page 56 of the March/April 2008 issue. Or you may send a fax request to the editor.

Articles, reports, reviews, and letters published in the SKEPTICAL INQUIRER represent the views and work of individual authors. Their publication does not necessarily constitute an endorsement by CSI or its members unless so stated.

Copyright ©2009 by the Committee for Skeptical Inquiry. All rights reserved. The SKEPTICAL INQUIRER is available on 16mm microfilm, 35mm microfilm, and 105mm microfiche from University Microfilms International and is indexed in the Reader's Guide to Periodical Literature.

Subscriptions and changes of address should be addressed to: SKEPTICAL INQUIRER, P.O. Box 703, Amherst, NY 14226-0703. Or call toll-free 1-800-634-1610 (outside the U.S. call 716-636-1425). Old address as well as new are necessary for change of subscriber's address, with six weeks advance notice. SKEPTICAL INQUIRER subscribers may not speak on behalf of CSI or the SKEPTICAL INQUIRER.

Postmaster: Send changes of address to SKEPTICAL INQUIRER, P.O. Box 703, Amherst, NY 14226-0703.

Skeptical Inquirer

March / April 2009 • Vol. 33, No. 2

26 **The Pearl Harbor 'Winds Message' Controversy: A New Critical Evaluation**

A new critical investigation by the National Security Agency confirms that a Japanese so-called 'Winds execute' message was not heard until hours after the attack on Pearl Harbor began on December 7, 1941, and, in any event, contained no actionable intelligence.

KENDRICK FRAZIER

32 **Science and Antiscience in America** *Why It Matters*

If science doesn't inform the decisions we make, the consequence is that people suffer.

ELIZABETH SHERMAN

36 **What Open-Mindedness Requires**

If we are to steer a course between being obstinately defensive and wantonly credulous, it is important to understand what open-mindedness requires. Here are ten aspects of being open-minded.

WILLIAM HARE

40 **Deep History or Shallow Cognition?** *Cognitive Biases and 'Esoteric History'*

A host of new media productions, from self-published books to blockbuster movies, have reignited the belief that extraterrestrial visitors aided early human civilization. In 2008, cognitive science is well equipped to speak on this claim and the fundamental errors in human reasoning to which it appeals.

JOHN RAY

44 **The Potential Habitable Zone on Saturn's Moon Enceladus**

Recent discoveries from NASA's Cassini spacecraft have led many scientists to believe that numerous microorganisms found on Earth could potentially survive on Saturn's moon Enceladus.

FELIX WASIAK

COMMENTARY

12 **Science, Reason, and the Obama Administration**

KENDRICK FRAZIER

COLUMNS

EDITOR'S NOTE
Happy Birthday, Mr. Darwin 4

NEWS AND COMMENT
Judge Jones and the Science/Religion Debate at Ohio State / Dutch, Belgian Creationist Groups Unite to Bring Anti-Evolution Message to Six Million / Six Common Medical Myths Gain Wide Attention / For the Record / UFOs by the Numbers 5

INVESTIGATIVE FILES
Searching for Vampire Graves
JOE NICKELL 16

THINKING ABOUT SCIENCE
The Tree of Life
MASSIMO PIGLIUCCI 20

NOTES ON A STRANGE WORLD
Ghostly Molds
MASSIMO POLIDORO 22

THE SKEPTICAL INQUIREE
Curious Contrails: Death from the Sky?
BENJAMIN RADFORD 25

NEW BOOKS 56

FORUM
How to Get Rich Quickly with 'Alternative' Medicine
EDZARD ERNST 57

FOLLOW-UP
What Do Skeptics Need to Explain?
DALE BEYERSTEIN 58

Critique of 'The Bipolar Bamboozle'
NIGEL BARK 60

Response to Critique of the 'Bipolar Bamboozle'
STEPHEN FLORA 62

LETTERS TO THE EDITOR 63

REVIEWS

Physics for Future Presidents: The Science Behind the Headlines
By Richard A. Muller
KENNETH W. KRAUSE 48

Autism's False Prophets: Bad Science, Risky Medicine, and the Search for a Cure
By Paul A. Offit, MD
GREG MARTINEZ 50

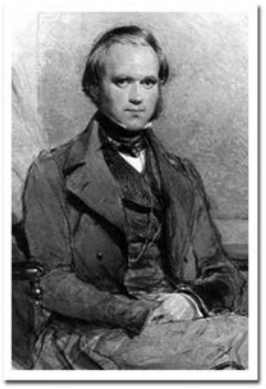
Saving Darwin: How to Be a Christian and Believe in Evolution
By Karl W. Giberson
GLENN BRANCH 51

Your Inner Fish: A Journey into the 3.5-Billion-Year History of the Human Body
By Neil Shubin
DANIEL GRASSAM 52

Paranormal State: The Complete Season One
BRIAN THOMPSON 53

Editor's Note

Happy Birthday, Mr. Darwin



You are going to be hearing a lot about Charles Darwin this year. Deservedly so. February 12 was his 200th birthday (the same as Abraham Lincoln's), and November 24 will mark the 150th anniversary of his *On the Origin of Species by Means of Natural Selection*. It sold out immediately (in addition to the power of his ideas, Darwin was a remarkably *readable* writer) and has rocked intellectual history ever since. By any measure it ranks as one of the most influential books ever published in the English language. As a scientific icon, Darwin ranks with Isaac Newton and Albert Einstein. Through rigorous observation and study, he (and independently Alfred Russel Wallace) developed one of the most powerfully explanatory and scientifically fruitful concepts about nature the world has ever seen.

Celebrations are underway or planned all over the world. Universities, museums, and scientific organizations nearly everywhere are involved. The landmark Darwin exhibition is at the Natural History Museum in London, which leads UK's "Darwin200" events, through April 19, 2009. It previously premiered to acclaim at the American Museum of Natural History in New York and also toured Boston, Toronto, and Chicago before arriving in London for the 200th anniversary. The London museum unveiled a specially commissioned artwork titled "Tree" on Darwin's birthday. A new work of classical music has been commissioned. Commemorative coins are being struck. Cambridge University plans a special festival. The HMS Beagle Project is building a modernized seagoing HMS *Beagle*, the ship on which Darwin served as naturalist, circumnavigating the globe from 1831 to 1836, gathering the evidence that led to his insights about natural selection as the driving force of evolution.

In the U.S., universities in all parts of the nation plan observances. The University of California at San Diego, to take just one example, has a yearlong "Darwin's Legacy" lecture series. The American Association for the Advancement of Science's annual meeting recognizes Darwin's impact with its theme "Our Planet and Its Life: Origins and Futures." *Science* magazine began a yearlong celebration of Darwin with its "Origins" issue of January 9. The journal *Nature* usefully posted on its Web site "15 Evolutionary Gems" it has published on why evolution by natural selection is an empirically validated principle. The University of California at Berkeley has put up an Understanding Evolution Web site.

A celebration of Darwin's ideas is integral to our own Center for Inquiry's 12th World Congress (co-sponsored by the Committee for Skeptical Inquiry) outside of Washington, D.C., April 9–12 (see our back cover). Among the speakers are philosophers Phillip Kitcher and Barbara Forrest and historian David Contosta, author of *Rebel Giants: The Revolutionary Lives of Abraham Lincoln and Charles Darwin.*

All these observances are an opportunity to celebrate not only the man and his ideas and their impact on the public sphere but the very nature of science itself. Scientific concepts built painstakingly on a combination of creative insight, meticulous observation, and solid evidence—repeatedly tested and reinforced as new disciplines and technologies emerge—have immense power to change the world.

—KENDRICK FRAZIER

Skeptical Inquirer™
THE MAGAZINE FOR SCIENCE AND REASON

EDITOR
Kendrick Frazier

EDITORIAL BOARD
James E. Alcock
Thomas Casten
Martin Gardner
Ray Hyman
Paul Kurtz
Joe Nickell
Lee Nisbet
Amardeo Sarma
Benjamin Wolozin

CONSULTING EDITORS
Susan J. Blackmore
John R. Cole
Kenneth L. Feder
Barry Karr
E. C. Krupp
Scott O. Lilienfeld
David F. Marks
Jay M. Pasachoff
Eugenie Scott
Richard Wiseman

CONTRIBUTING EDITORS
Austin Dacey
Harriet Hall
Chris Mooney
James E. Oberg
Robert Sheaffer
David E. Thomas

MANAGING EDITOR
Benjamin Radford

ART DIRECTOR
Christopher Fix

PRODUCTION
Paul Loynes

ASSISTANT EDITORS
Donna Danford
Julia Lavarnway
Andrea Szalanski

CARTOONIST
Rob Pudim

WEB-PAGE DESIGNER
Patrick Fitzgerald

PUBLISHER'S REPRESENTATIVE
Barry Karr

CORPORATE COUNSEL
Brenton N. VerPloeg

BUSINESS MANAGER
Sandra Lesniak

FISCAL OFFICER
Paul Paulin

VICE PRESIDENT OF PLANNING AND DEVELOPMENT
Sherry Rook

DATA OFFICER
Jacalyn Mohr

STAFF
Darlene Banks
Patricia Beauchamp
Cheryl Catania
Matthew Cravatta
Roe Giambrone
Leah Gordon
Sandy Kujawa
Anthony Santa Lucia
John Sullivan
Vance Vigrass

PUBLIC RELATIONS
Nathan Bupp
Henry Huber

INQUIRY MEDIA PRODUCTIONS
Thomas Flynn

DIRECTOR OF LIBRARIES
Timothy S. Binga

The SKEPTICAL INQUIRER is the official journal of the Committee for Skeptical Inquiry, an international organization.

Judge Jones and the Science/Religion Debate at Ohio State

KENNETH NICHOLS

In the course of her teaching career, Susan Fisher has had to cope with a serious problem that often hindered her ability to acquaint students with the wonders of the natural world. The Ohio State University resides on the tasseled fringe of the Bible Belt, consequently serving many students who, as a result of their earlier education, have trouble distinguishing "evidence-based thought" from "faith-based ideas." Thanks to a grant from the Templeton Foundation, Fisher, professor in Ohio State's department of entomology, is able to produce an annual series of lectures that addresses the problematic interaction of science and religion, as well as surrounding constitutional questions. The week of October 20, 2008, brought the first stark chill of Ohio autumn. The chill was warmed by the fascinating appearance of U.S. District Judge John Jones III, a person uniquely qualified to address these important issues.

Judge Jones delivered his talk, "Our Constitution's Intelligent Design," demonstrating the same wisdom and candor he displayed in his *Kitzmiller et al. v. Dover Area School District* decision (SKEPTICAL INQUIRER, March/April 2006, January/February 2007). He's had three years to reflect upon what he calls his "Dover experience." During that time, he has been lauded by scientists and advocates of secular humanism and vilified by those who disagreed with his ruling. Though received as a hero by the audience, he said he "wears the mantle of hero uneasily." While Judge Jones does not consider himself a scientist, he understands that now his life "is forever intertwined with Darwin."

With the nation's attention focused on him in the days before Christmas 2005, Judge Jones was justified in being proud of himself. After months of hearings and weeks of trial testimony, he and his staff had worked hard to deliver the 139-page decision as early as possible. Alas, Judge Jones soon learned that the pleasure derived from being mentioned in the lead story on the national news is fleeting and that hubris "is a debilitating thing." He and his wife tuned in to Fox News later that evening to watch Bill O'Reilly and a legal consultant "disemgarchs, deciding cases based upon personal opinion and rank ideology. "This is workmanlike," Judge Jones said. "This is not a magical process."

Some intelligent design proponents have tried to argue that their concept should be brought into public-school science classes on the wishes of the majority. Adhering to the majoritarian ideal, Judge Jones said, would "fail to observe or note those troublesome

U.S. District Judge John Jones III at Ohio State: 'Be careful how you elect school boards.'

bowel" him on national TV.

That, he explained, wasn't the end of it. The rest of the usual suspects blasted him on television and radio, and Ann Coulter criticized him in several pages of her book *Godless.* Judge Jones took these criticisms in stride but noticed that they had one thing in common: the pundits "didn't try to explain to the American public how the courts work."

This disconnect is what motivated Judge Jones to take his message to colleges across the country. Contrary to what you hear on talk radio, federal judges are not a shadowy cabal of moustache-twirling oli-

things such as the Bill of Rights, within that the First Amendment, and within that the Establishment Clause."

While there are no easy solutions, Jones believes he knows the reason for this misunderstanding. He cites our failure to provide children with a bedrock civics education and faults pundits from both sides of the aisle who simplify complicated cases into caricatures. He issues the charge to get involved in a proactive way. After all, one of the lessons of Dover is "Be careful how you elect school boards."

The pun in the title of his talk was

intended—born of the same wit that he demonstrated in his *Kitzmiller* decision. Many have taken note of the refreshingly blunt rhetoric in the document's conclusion, including the now-immortal phrase "breathtaking inanity" used to describe the Dover Board's decisions. Judge Jones revealed that the original draft of the conclusion was written with even less restraint. Told by first readers that he was "writing too hot," he tempered his rhetoric. The reason his conclusion became strident was that he thought of the children affected by the decision who were "right on the edge of getting that spark that could propel them into working toward a research position" but were going to be taught "junk."

Judge Jones was candid with respect to his personal perspective on the Dover case. Watching the passionate, dedicated lawyers arguing before him reminded him of why he wanted to go to law school. He smiled modestly for the audience when recounting the time he was at a reception in New York City and was sought out by actress Kathleen Turner. While he has participated in panel discussions with respect to legal issues, he doesn't like to engage in debates regarding his Dover verdict. "If you don't get it after 139 pages," he says, "there's not much I can do for you."

Jones still receives the occasional "you're going to go to hell" letter but doesn't let it bother him. He doesn't treat the more threatening letters lightly; these kinds of communication are the reason U.S. marshals were assigned to protect his family after the decision was rendered.

A great body of literature has emerged from the Dover trial, on both sides of the issue. Jones has particularly kind words for the NOVA special "Judgment Day: Intelligent Design on Trial" and Edward Humes's account of the trial, *Monkey Girl.*

Appropriately, Edward Humes delivered a lecture at Ohio State the next day: "Talk Radio Evolution: America's Love-Hate Relationship with Science." The auditorium, happily, was packed with young science students.

Humes framed his talk around the big problem confronting science teachers. He laments that there are competing theories of evolution in the mainstream. The first is the "talk radio theory of evolution." This version says that life is accidental, a "random crash of atoms" that culminates in a monkey serving as your great-great-grandfather. Then, of course, there is the "real theory of evolution."

For most people, these theories don't do battle in the science classroom but in a public forum rife with ignorance, propaganda, and willful misrepresentation. A key point, Humes believes, is not to allow the enemies of evolution to define it for the general public.

The bulk of his talk, a potent condensation of *Monkey Girl*, was received by the students with interest. In the post-talk question and answer period, Humes was asked about the contentious nature of the evolution/intelligent design debate. Appropriately, he compares it to a political issue: the Endangered Species Act. Years ago, both the Endangered Species Act and the teaching of evolution were bipartisan endeavors. These endeavors are now divisive. "Instead of a common goal," Humes said, "we have an ideological process."

The festivities at Ohio State concluded with this year's edition of the annual panel discussion on the relationship between science and religion. The panel was moderated by David Brancaccio, host of PBS's *NOW*, who promised a civil discussion. This promise was certainly kept by the panelists from the university: Carol Anelli (entomology), Connie Bertka (geology and theology), and Joan Roughgarden (evolutionary biology).

The three panelists seemed to hold religious beliefs that spanned the (Christian) spectrum and similar respect for the science behind evolution. The sticking point for the panelists appeared to be the percentage of religious consideration that should be allowed in science. Bertka acknowledged that the "science=how/religion=why" approach has been useful, but she believes that science must operate with an appropriate amount of theology. She confirmed the need to explain evolution and other scientific ideas to dedicated pew warmers to avoid an isolating experience: "Scientists can continue to do science," she said, "but it may not be a meaningful experience for anyone but themselves." (Bertka did not provide suggestions on how to get a rock-ribbed "young Earth creationist" to believe people didn't ride dinosaurs to work when the world began 6,000 years ago.)

Roughgarden attempted to unite science and religion, pointing to Jacob's speckled animals in Genesis as an example of natural selection. In her idea of human nature, "feeling is as important as knowing." When an audience member brought up religion's conflicted history with sex, Roughgarden said that the "way to 'clean up' religion, so to speak, is theological study; not through dismissing religion, because it's here to stay."

Anelli stood out and not only for the way she kept superstition out of her science. She seemed to suggest that those who want some kind of validation of the worth of our species should look to the arts and humanities.

The great lament of the panel discussion was that none of the panelists addressed the white elephant in the room: religious or spiritual beliefs must be proven empirically before they can serve usefully beside real science, otherwise these beliefs are inherently unscientific and their power in the human psyche is reinforced by their incredulity.

Are Fisher's efforts having an effect? She receives overwhelmingly positive feedback, primarily from faculty and community members. Most encouragingly, these lectures have engendered in-class discussions, challenging students to reconsider their (perhaps science-stifling) preconceptions about the necessity of the separation of church and state.

Kenneth Nichols is a fiction writer in the creative writing MFA program at The Ohio State University and teaches in the English department. E-mail: kenneth nicholswriting@yahoo.com.

Dutch, Belgian Creationist Groups Unite to Bring Anti-Evolution Message to Six Million

CREATIE.INFO
Home
Creatie.info | Monday, January 12, 2009
zoeken...
MAIN MENU
Home - New (s)
INFORMATION
Topics
Education
Reviews
In the media
Watching videos online
Online reading
WEBSITES
About the websites
Dutch
English
German
COLOPHON
CREATIE.INFO
www.creatie.info is a website with information about Evolution or Creation.
Also refers to other sites with more information.
In addition to the topic structure you can search to see what the chosen 'keyword' in English is published.
We also have a Website.
Action / Campaign: Creation or Evolution? What do you believe?
Print
Email
Wednesday, 05 November 2008 14:07
Action / Campaign: Creation or Evolution? What do you believe?
House-to-door campaign in the context of Darwin Year 2009
More than six million Dutch households will, if everything continues, early next year, the brochure "Evolution or creation - What do you believe?" By the bus. That will DV short just after the birth of Darwin happen. More can be found in:
Objective Campaign Updates +
Committee Recommendation
Collaborating organizations
Brochure
ONDERSTEUN ONS

The Web site www.creatie.info invites those interested to participate in the anti-evolution message.

Johan Huibers's recreation of Noah's Ark.

The upcoming year-long celebration of Darwin's 200th birthday (February 12, 2009) is causing a lot of excitement in the scientific world. Universities and other scientific institutions are organizing special commemorations and festivities around the world. But creationists, too, are preparing for a very busy year. The Answers in Genesis organization, for instance, is devoting a special issue of its *Answers* magazine to Darwin and has announced free conferences. In the Low Countries (the Netherlands and Belgium) the creationists have their own way of celebrating Darwin's birthday; they intend to distribute a brochure called "Evolution or Creation: What Do You Believe?" to six million mailing addresses, but only if they can collect the necessary €400,000 (about $500,000).

In support of this project, a committee of recommendation has been assembled. Among its members are Protestant ministers of different affiliations and Johan Huibers, the builder of a replica of Noah's ark that he uses as a traveling exhibit across the Netherlands. The spokesman for the project appears to be Kees van Helden, president of the Dutch creationist "Bible and Education" organization. Van Helden mailed a letter to 7,500 ministers, preachers, and church councils asking them to publicize the "Evolution or Creation" project within their churches and to ask for donations. Along with the letter, the recipients also received a brochure, which can also be found on the Internet. It features old creationist mantras like the two-kinds-of-science theory, the insufficiency of the fossil record, the geological column as "proof" of a worldwide flood, and the "fraud" of Haeckel's embryo drawings. The brochure concludes that "belief in the evolutionary theory cannot answer important questions like: "Where do I come from?, Why am I here?, and Where do I go when I die?" and that "if we believe in the Bible, there are answers to these questions." For more information, the curious reader is referred to a Web site, www.creatie.info, where he or she is invited to take part in the enterprise.

The Web site says the project is supported by twenty-eight creationist publishers and organizations from both the Netherlands and Belgium. Huibers, who has "rebuilt" the ark to teach children that the ark is more than just a toy, has explained his participation in this project on a program on national Dutch television. Claiming that dinosaurs were on the ark ("only the little ones") and that only eight people survived the flood, he also expressed his support for "balancing" evolutionary theory with the creation story in biology classes. Kees van Helden was interviewed on Dutch radio (an evangelical broadcast), and the project has been mentioned in quite a few Dutch newspapers.

It remains to be seen whether all this media exposure will suffice to raise the necessary funding. But the creationists are hopeful. As van Helden writes in his letter: "This letter is sent to 7,500 addresses, and if only half of them donate €100, then the required amount is already in." To be continued. . . .

—Stefaan Blancke

Stefaan Blancke is a doctoral researcher in the department of philosophy and moral science, Ghent University, Ghent, Belgium. E-mail: stefaan.blancke@ugent.be.

Six Common Medical Myths Gain Wide Attention

In a study published in the December 2008 issue of the *British Medical Journal*, two health researchers at the Indiana University School of Medicine explore the science behind six myths that are commonly associated with the holidays yet remain relevant year-round.

- Sugar makes kids hyperactive
- Suicides increase over the holidays
- Poinsettias are toxic
- You lose most of your body heat through your head
- Eating at night makes you fat
- You can cure a hangover with . . .

These beliefs are commonly accepted as true, not only by the general public but also by many physicians. To the surprise of the authors, Aaron Carroll and Rachel Vreeman, they found all six myths to be either false or unsupported by medical research. Carroll and Vreeman are health services researchers with the Indiana University Center for Health Policy and Professionalism Research, the Regenstrief Institute, and Indiana Children's Health Services Research.

Although the "myths" probably are no great surprise to readers of SKEPTICAL INQUIRER (or are they?), the study received worldwide publicity on TV, in newspapers and newsmagazines, and on the Web.

1. Does Sugar Make Kids Hyperactive?

This is without a doubt false, report Vreeman and Carroll, who are both pediatricians. "In at least 12 double-blinded, randomized, controlled trials, scientists have examined how children react to diets containing different levels of sugar," they write. "None of these studies, not even studies looking specifically at children with attention deficit-hyperactivity disorder, could detect any differences in behavior between the children who had sugar and those who did not." This includes sugar from candy, chocolate, and natural sources. Even in studies of children who were considered "sensitive" to sugar, children did not behave differently after eating sugar-full or sugar-free diets.

But what is most amazing, says Carroll, is that in studies in which parents think their children have consumed sugar, parents rate their children's behavior as more hyperactive, even if no sugar was consumed. "Obviously the differences in the children's behavior were all in the parents' minds," he says.

This doesn't mean that sugar is good for children, it only means that it doesn't make them hyperactive. "There are many good reasons for parents to restrict their children's sugar consumption, including risks for obesity and cavities," Dr. Vreeman notes.

2. Does the Number of Suicides Increase over the Holidays?

The holidays can bring out the worst in people, and the stresses of family get-togethers, loneliness, and the cold, dark winter months are commonly thought to increase the number of suicides at Yule time. But studies conducted around the globe show that while the holidays may be a difficult time for some, there is no scientific evidence to suggest a holiday peak in suicides, according to Vreeman and Carroll. Furthermore, suicides are actually more common during warm and sunny times of the year. They emphasize that suicidal thoughts should be taken seriously at all times.

3. Are Poinsettias Toxic?

Vreeman and Carroll found that the largest study of poinsettia "toxicity" to date involved an analysis of 849,575 plant exposures reported to the American Association of Poison Control Centers. None of the 22,793 poinsettia cases revealed significant poisoning. No one died from poinsettia exposures or ingestions, and more than 96 percent did not even require treatment in a healthcare facility. Another study, looking at poinsettia ingestion by rats, could not find a toxic amount of poinsettia, even at doses that would be the human equivalent of consuming 500–600 poinsettia leaves or a pound and a half of the plant's sap. Vreeman cautions, though, that you should always call a poison control cen-

ter if someone eats a plant not intended for consumption.

4. Do You Lose Most of Your Body Heat through Your Head?

Both Vreeman and Carroll assumed this one was true. After all, mothers have been repeating it for decades. But, in fact, it is not true.

They believe this myth likely originated with an old military study in which scientists put subjects in arctic survival suits without hats and measured their heat loss in cold temperatures. They did lose the most heat through their heads but only because it was the only bare part of their bodies. Vreeman and Carroll found that more contemporary experts say that had this same experiment been performed with subjects wearing only swimsuits, with much of their bodies exposed, the subjects would not have lost more than 10 percent of their body heat through their heads.

"Any uncovered part of the body loses heat and will drop the core body temperature proportionally," the IU researchers note. They recommend keeping all parts of the body warm when out in the cold, but the head does not require special attention. As pediatricians, they counsel parents to dress their children appropriately for the weather year round.

5. Does Eating at Night Make You Fat?

Vreeman and Carroll write that at first glance, some scientific studies seem to support this idea. But just because obesity and eating more meals at night are associated, it does not mean that one causes the other. People gain weight when they consume more calories overall than they burn. Eating more meals and taking in more calories makes you gain weight regardless of when the calories are consumed. The bottom line, they say, is that the time of day or night when one eats is irrelevant.

5. Can One Cure a Hangover with [fill in the blank]?

Both Vreeman and Carroll believed that neither "the hair of the dog" nor any other remedy could alleviate a hangover. And they were right. They found no scientific evidence supporting any cure for alcohol hangovers. A hangover is caused by excessive alcohol consumption. Thus, the most effective way to avoid a hangover is to consume alcohol in moderation or not at all.

Why did they do this study? "Examining common medical myths reminds us to be cognizant of when evidence supports our advice [as physicians or as parents], and when we operate based on unexamined beliefs. This was not a systematic review of either the evidence to refute these medical myths or of doctors' beliefs. Nonetheless, we applied rigorous research methodology to compile data, and evidence of the prevalence of these medical beliefs is readily available. Only by investigation, discussion, and debate can we reveal the existence of such myths and move the field of medicine forward," they write.

This year St. Martin's Press will publish their book *Don't Swallow Your Gum: Myths, Half-truths, and Outright Lies About Your Body and Health.*

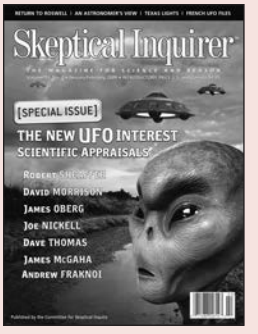
For the Record:

Corrections on articles in the January/February 2009 issue:

In "The Minsk UFO Case," in the caption on page 38, the bottom text reads "Sketches of the Minsk UFO as perceived from three different locations," but only the "Minsk" column is of the 1984 sighting; the left and right columns—as described in the text—are of *other* rocket launchings of the same type but on different dates. In the caption on page 41, Plesetsk is misspelled as Plesetsj.

In "UFOs: An Assessment of Thirty Years of Official Studies in France," the authors' sentence on page 50 "The Air France flight 3532 case (January 28, 1994)—the case most widely covered by media in the last fifteen years in France—shows a similar probable cause" leaves a misleading inference about the cause. It should have read: "The GEPAN shows a similar attitude toward the main witness in the Air France flight 3532 case (January 28, 1994)—the case most widely covered by media in the last fifteen years in France."

In the Thinking about Science column for January/February 2009, an experimental philosopher's name was misspelled. He is Joshua Knobe (not Kobe).



IGNITE THE ADVENTURE

The New Future Fund

"Knowledge is an unending adventure at the edge of uncertainty."
– Jacob Bronowski, scientific polymath

For a more rational tomorrow ... and the future of *Skeptical Inquirer* ... please support the new phase of the Center for Inquiry New Future Fund

Across our world, forward-thinking men and women have recognized the scientific paradigm as their surest guide for sound thinking and living. For them knowledge is the greatest adventure. Today the Center for Inquiry movement strives to keep the adventure of knowledge accessible to all. To defend science, reason, freedom of inquiry, and human values in an ever-changing world, we must adopt new methods ... new approaches. To realize tomorrow's ambitious goals, we must expand our organization.

The New Future Fund is an audacious, multiyear $26 million campaign to fund program needs, capital expansion, and endowment for the Committee for Skeptical Inquiry (CSI) and the Center for Inquiry.

In this new phase the focus turns to:

- **Outreach and education: publishing, media relations, personal outreach, and more**
- **Influencing public policy through our Center in the nation's capital**
- **Enhancing the Committee for the Scientific Examination of Religion (CSER)**
- **The Naturalism Research Project: library expansion, research fellowships, and other initiatives to spur exploration of the naturalist tradition**
- **Transnational development: reaching beyond borders through the United Nations and direct activism around the globe**

As always, the New Future Fund supports new and established programs, including *Skeptical Inquirer* and CSI's vital media and public education work. Because our work is so important, please make your most generous gift today to support program expansion. By pledging a larger gift over a three- or four-year period, you may find a significant contribution more affordable. Our development staff stands ready to answer questions you may have about asset transfers, planned giving arrangements, and the like. All gifts are fully tax-deductible to the extent allowed by law.

Toni Van Pelt, Paul Kurtz, and Ron Lindsay (standing); Lawrence Krauss, David Helfland, and Nobel Laureate Paul Boyer (seated) introduced the Declaration in Defense of Science and Secularism at the inaugural press conference of the Center for Inquiry/Office of Public Policy in Washington, D.C.

Local leaders, campus activists, and students from around the world came together at CFI's Summer Session.

Latin American and U.S. skeptical activists met at the CFI-sponsored First Iberoamerican Conference on Critical Thinking in Peru.

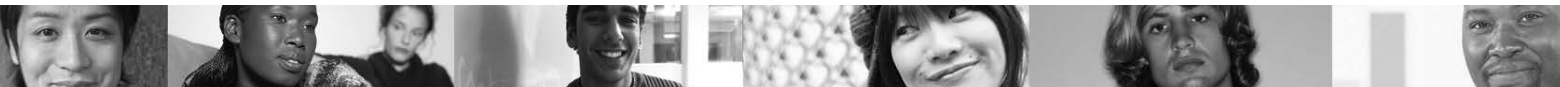
The new Naturalism Research Project will more than double our library facilities and create a collegial setting for scholarly dialogue and research.

For more information or to make a gift, return the tear-out card facing this ad or contact:

Center for Inquiry
Department of Development P.O. Box 741, Amherst NY 14226-0741
1-800-818-7071 | development@centerforinquiry.net

CFI CENTER FOR INQUIRY

CSI Committee for Skeptical Inquiry



UFOs by the Numbers: Public Opinion Poll Results

Public opinion polls about UFOs (or about the "paranormal" or evolution/creationism, for that matter) are always dissatisfying to science-oriented people because they usually ask about *belief* rather than posing questions about what the scientific evidence supports. The questions are often problematic in other ways as well. Nevertheless, they're generally all we have. Here are some recent poll results regarding UFOs.

Scripps Survey Research Center/Ohio State University survey of 1,003 adults, May 11–28, 2008, issued July 26, 2008:

Has intelligent life from other planets visited Earth?

12% Very likely
21% Somewhat likely
54% Unlikely
13% Don't know/Other

Do you know anyone who has seen a mysterious light in the sky that may have been a visitor from another world?

19% Yes
80% No

Have you, personally, ever seen a mysterious object in the sky that might have been a visitor from another world?

8% Yes
91% No

MSNBC Poll, 2007 (10,311 responses):

Do you believe some UFO sightings are actually visits from extraterrestrials?

63% Yes
25% Maybe
12% No

Harris Poll of Religious and Other Beliefs of Americans, November 2005

34% Believe in UFOs
41% Don't believe in UFOs
25% Not sure

Roper Poll on UFOs and Extraterrestrial Life for Sci Fi Channel, 1,021 adults, September 2002:

56% Think that UFOs are something real and not just people's imagination
48% Say they think UFOs have visited the earth in some form over the years
45% Say they think humans have already interacted with extraterrestrial lifeforms
12% Say they or someone else they know has seen a UFO at close quarters
72% Say that the government is not telling the public everything it knows about UFOs
68% Say that the government is not telling the public everything it knows about extraterrestrial life

National Science Foundation Survey of Public Understanding of Science and Technology, 2001 (survey of 1,574 adults):

Belief that unidentified flying objects are space vehicles from other civilizations

3% Strongly agree
27% Agree
13% Do not know
45% Disagree
12% Strongly disagree

Gallup Poll of Belief in Paranormal Phenomena, 2001:

Extraterrestrial beings have visited earth at some time in the past.

33% Believe (In 1990, the answer to the same question was that 27 percent believe.)

CNN/Time poll of 1,024 adults issued June 15, 1997 (at the height of publicity about fiftieth anniversary of the Roswell incident):

64% of respondents said that aliens have contacted humans; half said they've abducted humans; and 37 percent said they have contacted the U.S. government. Nearly two-thirds of respondents said they believed that a UFO crash-landed in a field outside of Roswell, New Mexico.

Gallup Poll, September 1996:

In your opinion, are UFOs something real or just people's imagination?

48% Real
31% Imagination
21% No opinion

Do you think that UFOs have ever visited the earth in some form?

56% Yes
39% No
16% No opinion

In your opinion, does the U.S. government know more about UFOs than they are telling us?

71% Yes
19% No
10% No opinion

—Poll data compiled by Kendrick Frazier from Web sources

Science, Reason, and the Obama Administration

KENDRICK FRAZIER

Will the new presidency of Barack Obama usher in a more welcoming age for science and reason? We at least have cause for hope. A president's intellectual outlook is only one of many things that shape changes in culture and society, but the early signs are encouraging.

The Bush administration chalked up so many negatives in regard to scientific thinking, reason, and open inquiry that there may be no way to go but up. Bush himself is a born-again Christian and encouraged the far-right evangelical wing of his party; he ascribed to the "equal time" strategy of creationists in their opposition to teaching evolution, for example. His political appointees left a long and well-documented record of ideological interference with the recommendations of scientists at NASA, the Environmental Protection Agency, the U.S. Fish and Wildlife Service, and on and on. He restricted stem-cell research and only begrudgingly came to accept global warming. He actively practiced a "from the gut" style of decision making that marginalized well-informed rational analysis and caused a litany of international problems. (Bush did gain late-term praise from scientists and conservationists for his January 6 action creating three new marine national monuments in the Pacific Ocean, protecting 195,000 square miles of coral reefs and unique underwater ecosystems.)

The Obama White House could hardly have a more distinguished set of people in the key science positions. And it sounds as if Obama sees them as more than figureheads.

Obama, elected by a 53 to 47 percent margin, is the stark opposite of Bush in many key respects. His background is multicultural, his outlook international. He espouses learning and education, including science education. He exhibits a welcome centrist, moderate, pragmatic outlook that seems to eschew ideological extremes on either side of the political spectrum. He has repeatedly demonstrated intellectual agility, a critical acuity, and an ability to synthesize and plan. He has shown an obvious willingness to entertain a wide variety of viewpoints before making decisions, one mark of a critical thinker. He shows every tendency to welcome the best minds to his administration, even former rivals, and to listen to them. He signaled early on that he quickly will rescind the Bush administration's rulings against research on new lines of stem cells. He recognizes that climate change is real and says, "We all believe what the scientists have been telling us for years now, that this is a matter of urgency and national security, and it has to be dealt with in a serious way."

His lengthy written response during the campaign to the top fourteen science questions facing America (www.science debate2008.com) was shaped by numerous scientific notables including Nobel laureates—a welcome sign in itself—and said everything a science-minded person likes to hear. (The topics were climate change, energy, education, national security, pandemics and biosecurity, genetics, stem cells, ocean health, water, space, science integrity, research, and health.) He promises to defend scientific integrity: "I will restore the basic principle that government decisions should be based on the best-available, scientifically valid evidence and not on the ideological predispositions of agency officials or political appointees."

His appointment of Nobel laureate

Kendrick Frazier is editor of the SKEPTICAL INQUIRER *and a fellow of the American Association for the Advancement of Science. He is editor of a forthcoming anthology of SI articles,* Science Under Siege: Defending Science, Exposing Pseudoscience, *to be published by Prometheus Books in May.*

physicist Steven Chu, director of Lawrence Berkeley National Laboratory, as energy secretary harks back to a welcome tradition when distinguished scientists headed the top energy agency (the Atomic Energy Commission, a forerunner to the Department of Energy).

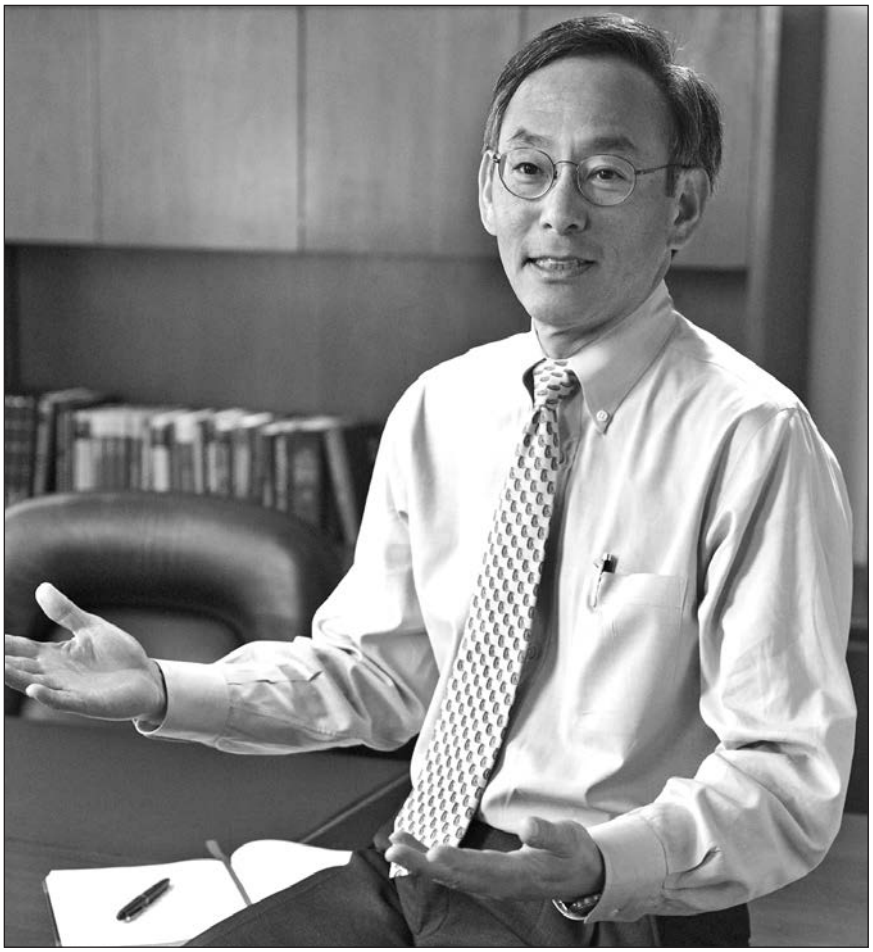
Some scientists called for him to quickly appoint a top-flight science advisor and give that person prominent status in the White House. Obama had pledged to strengthen the role of the President's Council of Advisors on Science and Technology and to restore the credibility and role of the Office of Science and Technology Policy as an office within the White House structure. But it didn't happen immediately. The first month of Obama's post-election transition was necessarily devoted to responding to the sudden U.S. and world financial crisis that brought the most serious downturn in the economy since the Great Depression. He rapidly assembled his economic and national security teams before beginning the rest of his cabinet and other appointments. Given the urgent circumstances, few would dispute that priority.

Word about Obama's science advisor appointment then came on December 19, the day after he completed his cabinet appointments. His science advisor is John Holdren, a respected physicist long known for his work on energy, climate change, and nuclear proliferation. Holdren is director of the program on science, technology, and public policy at Harvard University's Kennedy School of Government. He was president of the American Association for the Advancement of Science (AAAS) in 2006.

Obama's appointee as head of the National Oceanic and Atmospheric Administration, another key science appointment, is marine biologist Jane Lubchenco. She is professor of marine biology at Oregon State University and the OSU Distinguished Professor of Zoology. She is a MacArthur Fellow and, like Holdren, also a former AAAS president. "When has NOAA been headed by a member of the National Academy and a fellow of the Royal Society?" commented Andrew Rosenberg, a University of New Hampshire professor of natural resources and a former NOAA deputy director under the Clinton administration. "That's exactly the right signal. . . . It establishes NOAA as one of those key scientific agencies." He called her an "absolutely world-class scientist" and said the appointment means science agencies now have a role in policy.

In his science team rollout radio address of December 19, Obama not only announced those appointments but also revealed that science notables Harold Varmus and Eric Lander would be co-chairs of the President's Council of Advisors on Science and Technology along with Holdren. "Together, they will work to remake PCAST into a vigorous external advisory council that will shape my thinking on the scientific aspects of my policy proposals," said Obama.

Varmus is a 1989 Nobel laureate in medicine, former director of the Na-



Nobel laureate physicist Steven Chu, director of Lawrence Berkeley National Laboratory, is Obama's energy secretary.

Obama's science advisor is John Holdren.

tional Institutes of Health, and president of Memorial Sloan-Kettering Cancer Center. Lander, director of the Broad Institute at MIT and Harvard, was, as Obama proudly said, "one of the driving forces behind mapping the human genome—one of the greatest scientific achievements in history."

So the Obama White House could hardly have a more distinguished set of people in the key science positions. And it sounds as if Obama sees them as more than figureheads.

"It is time to once again put science at the top of our agenda and work to restore America's place as the world leader in science and technology," said Obama, words that should please all who have long been warning of America's slippage in the world of science. And for those concerned about the integrity of science and its previous abuses, his words were an early Christmas present: "The truth is that promoting science isn't just about providing resources—it's about protecting free and open inquiry. It's about ensuring that facts and evidence are never twisted or obscured by politics. It's about listening to what our scientists have to say even when it's inconvenient—especially when it's inconvenient. Because the highest purpose of science is the search for knowledge, truth, and a greater understanding of the world around us. That will be my goal as president of the United States—and I could not have a better team to guide me in this work."

And in his January 20 inaugural address minutes after being sworn in, President Obama declared: "We will restore science to its rightful place." Also, his historic recognition of nonbelievers ("a nation of Christians and Muslims, Jews and Hindus—and nonbelievers") gained the gratitude of secularists. "Truly historic and remarkable," our Center for Inquiry called it.

So the outlook is tentatively hopeful for a time in which scientific thinking, education, learning, and unfettered inquiry will have some greater support and encouragement from the highest position in the land. And that is welcome.

* * *

Nevertheless, there are limitations to how much a president can do. Money is the top problem. The federal budget was under serious pressures even before the October-November financial meltdown and the resulting hundreds of billions of dollars of taxpayer-financed bailouts. Obama's first large spending program announced as president-elect was to rebuild the nation's infrastructure, surely a welcome and much-needed enterprise. But that spending will further restrict his options on funding new programs of scientific research. Unless and until the economy can begin expanding again, science will have access to one piece of a shrinking pie.

An early sign of this problem was a statement from Obama's new economic council director Lawrence Summers that while an increase in federal research and development is good for the long-term health of the economy, R&D would not be included in the economic stimulus package. The Association of American Universities subsequently released a proposal sent to Obama for just such a stimulus, including "academic research facilities modernization and $1.8 billion to research universities to hire more young scientists and engineers."

Jane Lubchenco, President Obama's appointee to head the National Oceanic and Atmosphere Administration.

Secondary-school education in the U.S. is funded mainly at local and state levels, and those entities are likewise under new financial constraints. And, even if they weren't, money isn't the sole solution. Results of the Trends in International Mathematics and Science Study (TIMSS) announced in December show U.S. students performed no better on this international science exam than ten years ago, while a number of other countries' performances rose. One bright spot was U.S. students' performance in mathematics. The average score among fourth graders has jumped 11 points since 1995, to 529. Eighth graders also earned a higher average score than in 1995 and scored better than their counterparts in thirty-seven countries (but still lower than China, South Korea, Singapore, and Hong Kong). Educators and policy makers have been focused on improving math education in recent years. One can hope science education and scientific literacy will likewise gain new emphasis in American culture.

And while it will be wonderful to have a president who doesn't doubt evolution, national political leadership can only go so far in shaping attitudes in this area. Well-funded evangelical groups are still mounting intense media campaigns denouncing evolution as false science or worse and extolling two-thousand-year-old biblical stories as real science. Much of this effort takes place on religious television broadcasts, in churches, and in political action at the local and state level. As communications researcher Jon D. Miller has said, America is out on a limb by itself in its rejection of evolution. Polls show the U.S. is thirty-third out of thirty-four countries in evolution acceptance (only Turkey rates lower). That's not going to be fixed by a new president, no matter how enlightened.

Whether the economy and budget considerations end up trumping the hopeful plans and intentions of the Obama administration remains to be seen. But he represents a welcome breath of fresh air and a sense of hope to all who support science-based inquiry and the use of rationality and reason in examining issues important to us all. □

Searching for Vampire Graves

Given the ubiquitousness of vampires, those undead beings who are driven by bloodlust (and who thrive in movies like 2008's popular *Twilight*), it should not be surprising that historically there have been instances of reputed vampirism in the United States, notably in New England. And today there is a veritable vampire industry in New Orleans. I have investigated these cultural trends on site, tracking the legendary creatures to their very graves.

New England

New England has always been an admixture of both austere skepticism and passionate superstition. Vampire legends lurk in the latter. According to one vampirologist, "The presence in New England of a strongly rooted vampire mythology is something of an enigma to folklorists. There is quite simply no other area in all of North America with such wealth of vampire lore" (Rondina 2008, 165).

One of the best known examples is the case of nineteen-year-old Mercy Lena Brown in Exeter, Rhode Island, in 1892—a case that supposedly influenced Bram Stoker, author of *Dracula* (1897). As Katherine Ramsland (2002, 18) concisely tells the story:

> George Brown lost his wife and then his eldest daughter. One of his sons, Edwin, returned and once again became ill, so George exhumed the bodies of his wife and daughters. The wife and first daughter had decomposed, but Mercy's body—buried for three months—was fresh and turned sideways in the coffin, and blood dripped from her mouth. They cut out her heart, burned it, and dissolved the ashes in a medicine for Edwin to drink. However, he also died, and Mercy Brown became known as Exeter's vampire.

Accounts of the exhumation in the *Providence Journal* of March 19 and 21, 1892, acknowledge that the Browns died of consumption (tuberculosis). They do not mention the corpse of Lena (as she was actually known) being turned on its side or blood dripping from the mouth. The exhumation was conducted by a young Harold Metcalf, MD, from the city of Wickford. "Dr. Metcalf reports the body in a state of natural decomposition, with nothing exceptional existing," stated the *Journal*. "When the doctor removed the heart and the liver from the body a quantity of blood dripped therefrom, but this he said was just what might be expected from a similar examination of almost any person after the same length of time from disease." The article added, "The heart and liver were cremated by the attendants" ("Exhumed" 1892).

A follow-up article ("Vampire" 1892) noted that the heart's blood was "clotted and decomposed . . . just what might be expected at that stage of decomposition." The correspondent acknowledged the custom of an afflicted person consuming the ashes to effect a cure, stating, "In this case the doctor does not know if this latter remedy was resorted to or not, and he only knows from hearsay how ill the son Edwin is, never having been called to attend him."

And so ends "Unarguably the best known incident of historical vampirism in America," indeed the story of "The Last Vampire" (Rondina 2008, 83, 99). However, there are many other reported cases typically involving consumption. The victim's lethargy, pale appearance, coughing of blood, and contagiousness all suggested to the superstitious the result of a "vampire's parasitic kiss" (Citro 1994, 71).

The Demon Vampire

In 2008 I went in search of vampire cases in Vermont. Apparently the earliest reported vampire incident took place in Manchester in 1793. Four years earlier, Captain Isaac Burton—a deacon in the congregational church—wed Rachel Harris. Judge John S. Pettibone (1786–1872) picks up the story:

> She was, to use the words of one who was well acquainted with her, "a fine, healthy, beautiful girl." Not long after they were married she went into a decline and after a year or so she died of consumption. Capt. Burton after a year or more married Hulda Powel, daughter of Esquire Powel by his first wife. Hulda was a very healthy, good-looking girl, not as handsome as his

Joe Nickell, PhD, is the author of numerous books, including Entities *and* Adventures in Paranormal Investigation. *His Web site is at www.joenickell.com.*

> first wife. She became ill soon after they were married and when she was in the last stages of consumption, a strange infatuation took possession of the minds of the connections and friends of the family. They were induced to believe that if the vitals of the first wife could be consumed by being burned in a charcoal fire it would effect a cure of the sick second wife. Such was the strange delusion that they disinterred the first wife who had been buried about three years. They took out the liver, heart, and lungs, what remained of them, and burned them to ashes on the blacksmith's forge of Jacob Mead. Timothy Mead officiated at the altar in the sacrifice to the Demon Vampire who it was believed was still sucking the blood of the then living wife of Captain Burton. It was the month of February and good sleighing. Such was the excitement that from five hundred to one thousand people were present. This account was furnished me by an eye witness of the transaction.

Not only is Judge Pettibone's informant unnamed, but his manuscript (which still exists in the Manchester Historical Society [Harwood 2008]) is of uncertain date, although penned sometime between 1857 and 1872 (*Proceedings* 1930, 147). I located a Burton family history (Holman 1926) that makes no mention of the vampire tale but does confirm the sequence of marriages and deaths. (Captain Burton married Rachel Harris on March 8, 1789, and she died on February 1, 1790. He married Hulda Powell on January 4, 1791, and she succumbed on September 6, 1793.)

Therefore, the Pettibone account could be true. The salient point, however, is that belief in "the Demon Vampire" was indeed nothing more than a "strange delusion." Pettibone places the bizarre sacrifice about three years after Rachel's burial, which means the event occurred in early 1793, and Huldah died later that year. Clearly, anti-vampire magic was no cure for consumption.

I attempted to locate Rachel's grave. Isaac Burton and his fourth wife Dency Raymond (1774–1864) are buried together in the old section of Dellwood Cemetery in Manchester (Holman 1926, 25–28). The graves were relocated there from the old burial ground on the village green, today's courthouse site, where many old, unmarked graves are thought yet to remain (Harwood 2008). Among them may be the lost grave of the beautiful but unfortunate Rachel Harris.

Photo by Joe Nickell

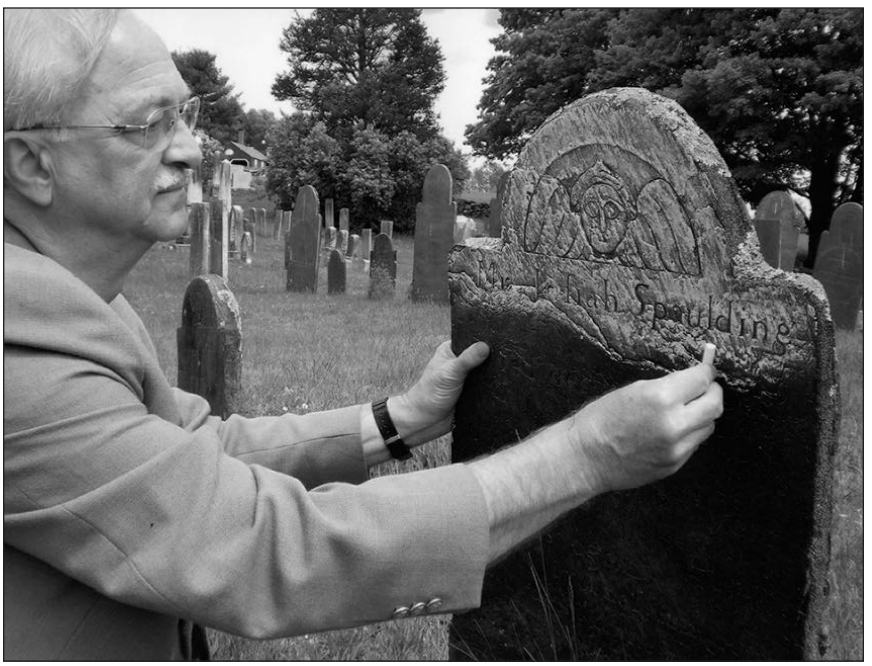
Figure 1. The Spaulding graves of vampire legend in Vermont's Dummerston Center Cemetery.

On Woodstock Green

Another story comes from Woodstock, where sources claim a vampire's heart was burned on the public green around 1829. The earliest account appeared in *The Journal of American Folklore* (Curtin 1889, 58–59). The story was later retold in the *Boston Transcript*, followed by an expanded version "Vampirism in Woodstock" in the October 9, 1890, *Vermont Standard* (quoted in Stephens 1970, 71–74). This gave the man's family name as Corwin. (Composite, garbled

versions have since appeared [e.g., "Vampire Incidents" 2008].) According to the original source (Curtin 1889, 58):

> The man had died of consumption six months before and his body buried in the ground. A brother of the deceased fell ill soon after, and in a short time it appeared that he too had consumption; when this became known the family determined at once to disinter the body of the dead man and examine his heart. Then they reinterred the body, took the heart to the middle of Woodstock Green, where they kindled a fire under an iron pot, in which they placed the heart, and burned it to ashes.



Author's photo by Diana G. Harris

Figure 2. The author uses chalk to enhance the tombstone of Josiah Spaulding, which is topped with the familiar image of the Angel of Death.

Unfortunately, not only was the story sixty years old at the time it appeared, but the writer failed to give any source other than an "old lady" in Woodstock who "said she saw the disinterment and the burning with her own eyes." The editor of *The Vermont Standard* added much supplementary material, claiming that the pot of ashes was buried under a seven-ton granite slab and that persons digging at the site a decade later encountered a sulfurous smell and smoke. This reference to the fires of Hell reveal the editor's writing as tongue-in-cheek, even sarcastic, and discredits his other details: the man's name as Corwin and burial in the Cushing Cemetery. Small wonder that no one of that name is buried in that graveyard—as shown by cemetery records (Stillwell and Proctor 1977) and confirmed by a search among the old tombstones by my wife and me (see also Crosier 1986; Wendlong 1990).

Misunderstanding the editor's satire, popular writers have tended either to give too much credence to the story or to debunk or dismiss it altogehter. Possibly the original account did contain a nucleus of truth, an early account of consumption and superstitious belief associated with it.

The Killing Vine

Yet another old case, again involving consumption and associated superstition, has been reinterpreted by moderns as a "vampire incident" ("Vampire" 2008; Rondina 2008, 104). The story, in David L. Mansfield's *The History of the Town of Dummerston* (1884)—itself an account written some ninety years after the events and based on oral tradition—has become somewhat garbled by writers copying writers. Therefore, I tracked down a copy of the original text for study. It relates that Lieutenant Leonard Spaulding died of consumption in 1788, aged fifty-nine, father of eleven children. Mansfield states (1884, 27):

> Although the children of Lt. Spaulding, especially the sons, became large, muscular persons, all but one or two died under 40 years of age of consumption, and their sickness was brief.
>
> It is related by those who remember the circumstance; after six or seven of the family had died of consumption, another daughter was taken, it was supposed, with the same disease. It was thought she would die, and much was said in regard to so many of the family's dying of consumption when they all seemed to have the appearance of good health and long life. Among the superstitions of those days, we find it was said that a vine or root of some kind grew from coffin to coffin, of those of one family, who died of consumption, and were buried side by side; and when the growing vine had reached the coffin of the last one buried, another one of the family would die; the only way to destroy the influence or effect, was to break the vine; take up the body of the last one buried and burn the vitals, which would be an effectual remedy: Accordingly, the body of the last one buried was dug up and the vitals taken out and burned, and the daughter, it is affirmed, got well and lived many years. The act, doubtless, raised her mind from a state of despondency to hopefullness [sic].

Now, Spaulding and his wife Margaret (who died in 1827) were buried in separate cemeteries and in unmarked graves. However, I located all but two of the children's graves, including a row of six in the Dummerston Center Cemetery (figures 1 and 2).

Unfortunately for the quaint legend related by oral tradition, the graves (whether linked by hidden underground vines or not) are not placed consecutively in the order of the family members' deaths. Neither did the last of the six, Josiah, die very close in time to the previous sibling's demise, since more than five-and-a-half years passed since the death of John. Of course, the family may well have been plagued by consumption, and it is possible Josiah's body was disinterred and the vitals burned. In any event, he was indeed followed in death by one of Leonard Spaulding's daughters, as the legend states, since after he died only Olive remained alive. Apparently, she lived on

for years, moving with a second husband to Brattleboro (Mansfield 1884, 26)—perhaps this being the secret of her having avoided the contagion!

In New Orleans

In sharp contrast to vampire legends of New England are those of New Orleans. While Louisiana indeed has a folk tradition of werewolves (the Loup-Garous of the Cajuns), the vampire culture there is not folklore but fakelore.

When I investigated various topics in the New Orleans area in 2000 (Nickell 2004, 140–161, 165–175), I found frequent references to vampires. The various nighttime tours focusing on cemeteries, voodoo, and ghosts invariably touted vampires as well, and guides (like mine) regaled tourists with spine-tingling tales of the "undead."

Anne Rice (born Howard Allen O'Brien in 1941) inspired legions of fans with her series of erotic horror novels, beginning with *Interview with the Vampire* (1976). Until she repudiated the genre, returned to her Catholic faith, and moved from New Orleans in 2005, many Rice devotees made pilgrimages to the Big Easy. Some walking tours included Rice's home or the location of the filming of *Interview*. There was even a tour book, *Haunted City: An Unauthorized Guide to the Magical, Magnificent New Orleans of Anne Rice* (Dickinson 1997).

According to Victor C. Klein, who has compiled two books of New Orleans ghost legends, "Throughout my extensive researches I have never encountered any tangible trace of Vampirism in Louisiana or New Orleans." He adds, "The genesis for such beliefs is directly attributable to the commercial imagination of Ms. Rice and the cebretonic endomorphs who, in their mad dash to establish a subjective species of identity and immortality, elevate her works to gospel status" (1999, 106). He also speaks of "the hyperbolic balderdash which spews forth from the black garbed tour guides who are more interested in money and sensationalism than accurate historical research" (1999, 64).

I recall one of the more responsible guides laughingly telling me how a customer once inquired about a particular grave featured in a Rice story and would not be convinced that the site was purely fictional. But I think the evidence shows that that grave is just as authentically vampiric as any real graves in New Orleans, New England, Europe, or elsewhere. □

I recall one of the more responsible guides laughingly telling me how a customer once inquired about a particular grave featured in [an Anne] Rice story and would not be convinced that the site was purely fictional.

Acknowledgments

My wife, Diana G. Harris, helpfully accompanied me on my trip to Vermont. Timothy Binga, director of CFI Libraries, provided much research assistance, and I am grateful to Paul Loynes for typesetting and indeed the entire SKEPTICAL INQUIRER staff for help at all levels.

I am especially grateful to the following gracious Vermont people and institutions for their crucial assistance: in Woodstock, the staff of the Norman Williams Public Library, including reference-desk attendant John Donaldson, and the staff of the Woodstock Inn and Resort (for free coffee and tea!); in Dummerston, Town Clerk Pam McFadden and historian Paul Normandeau; and in Manchester, the staff of the Mark Skinner Library, Assistant Town Clerk Bear Scovil, Dellwood Cemetery caretaker Kurt Baccei, and, especially, curator of the Manchester Historical Society, Dr. Judy Harwood.

References

Bunson, Matthew. 2000. *The Vampire Encyclopedia*. New York: Gramercy Books.

Citro, Joseph A. 1994. *Green Mountain Ghosts, Ghouls and Unsolved Mysteries*. Boston: Houghton Mifflin.

Crosier, Barney. 1986. Vermont's vampire heart. *Rutland Herald*, October 26.

Curtin, Jeremiah. 1889. European folk-lore in the United States. *Journal of American Folklore*. 2:4 (March), 56–59.

Dickinson, Joy. 1997. *Haunted City: An Unauthorized Guide to the Magical, Magnificent New Orleans of Anne Rice*. Secaucus, N.J.: Citadel Press.

"Exhumed the Bodies . . . ." 1892. *Provincetown Journal*, March 19 (reprinted in Rondina 2008, 86–87).

Hard, Walter R., Jr., and Janet C. Greene, eds. 1970. *Mischief in the Mountains*. Montpelier, Vermont: Vermont Life Magazine.

Harwood, Judy. 2008. Personal communication, May 21, July 9.

Holman, Winifred Lovering. 1926. *Descendants of Josiah Burton of Manchester*, Vt. Concord, N.H.: The Rumford Press.

Klein, Victor C. 1999. *New Orleans Ghosts II*. Metairie, La.: Lycanthrope Press.

Mansfield, David L. 1884. *The History of the Town of Dummerston*. Ludlow, Vt.: Published by Miss A.M. Hemenway.

Nickell, Joe. 2004. *The Mystery Chronicles: More Real-Life X-Files*. Lexington, Ky.: University Press of Kentucky.

Pettibone, Judge John S. N.d. The early history of Manchester. In *Proceedings 1930*, 147–166.

Proceedings of the Vermont Historical Society. 1930. New series, vol. 1, no. 4.

Ramsland, Katherine. 2002. *The Science of Vampires*. New York: Berkley Boulevard Books.

Rice, Anne. 1976. *Interview with the Vampire*, New York: Alfred A. Knopf.

Rondina, Christopher. 2008. *Vampires of New England*. N.p.: On the Cape Publications.

Stevens, Rockwell. 1970. "The Vampire's Heart," in Hard and Greene 1970, 71–80.

Stoker, Bram. 1897. *Dracula*. Reprinted, New York: Barnes & Noble, 2003.

Stillwell, Dorothy, and Dorothy L. Proctor. 1977. Cushing cemetery file; typescript at Norman Williams Public Library, Woodstock, Vermont.

Vampire incidents in New England. 2008. Available online at www.foodforthedead.com/map.swf; accessed May 9.

"The Vampire Theory." 1892. *Providence Journal*, March 21; reprinted in Rondina 2008, 89–96.

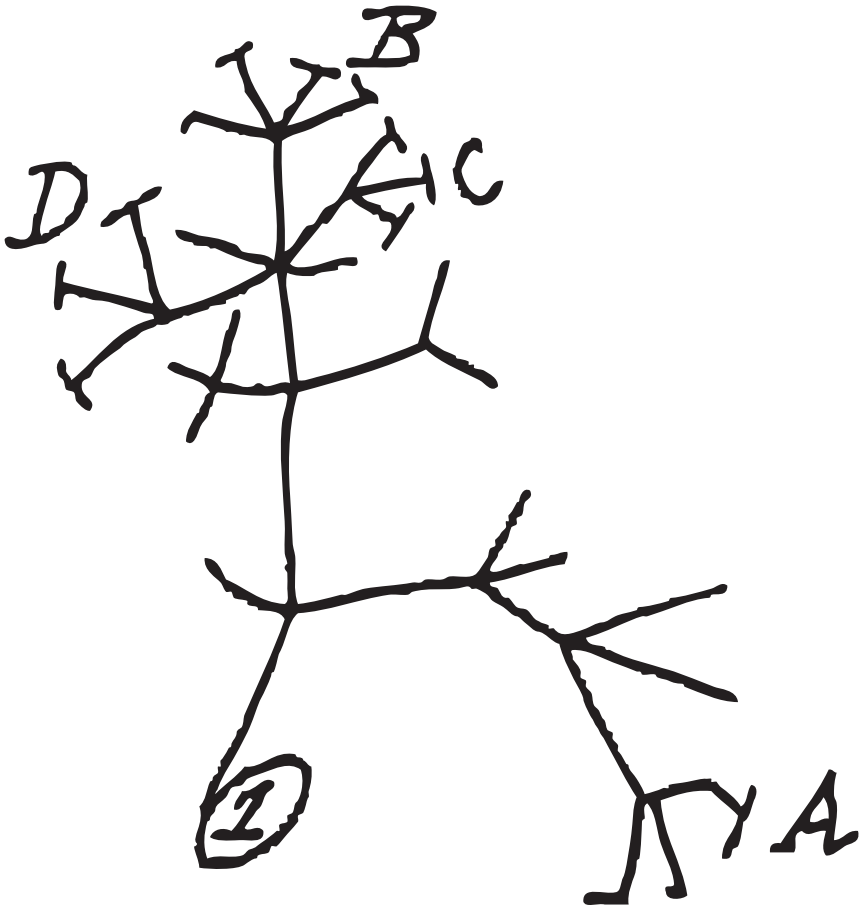
"Vampirism in Woodstock." 1890. *Vermont Standard*, October 9; reprinted in Stephens 1970, 71–74.

Wendling, Kathy. 1990. Woodstock's vampire: The heart of the legend. *Vermont Standard*, October 25.

The Tree of Life

Two ideas are fundamental to the Darwinian view of life: common descent and natural selection. The latter is the mechanism that originates adaptations (i.e., the "fit" between organisms and their environment). The eye is an adaptation to capture information-carrying electromagnetic waves/particles of light, and there is little question that it evolved, at least in part, by natural selection. Common descent says that all life on Earth is related, that organisms evolve from each other in an unbroken sequence of events that has been going on since the origin of life.

Darwin famously drew only one figure in *The Origin of Species*, which was published 150 years ago: a tree-like structure representing the idea of common descent. The "tree of life," as it has come to be known, is an iconic picture in modern biology, and there is a multinational project entirely devoted to it (http://tolweb.org/tree/). The idea behind the project is to eventually put all known species of organisms in their proper place on the evolutionary tree.



Massimo Pigliucci is professor of evolutionary biology and philosophy at Stony Brook University in New York, a fellow of the American Association for the Advancement of Science, and author of Denying Evolution: Creationism, Scientism and the Nature of Science. *His essays can be found at www.rationallyspeaking.org.*

But what if the history of life does not actually look like a branching tree? Are we then to reject the idea of common descent? Is this the fatal blow to Darwinism long sought by creationists and intelligent design proponents? A recent symposium held at the 2008 Philosophy of Science meetings in Pittsburgh explored the question of whether there is a tree of life, with philosophers and biologists engaged in earnest discussion on the topic.

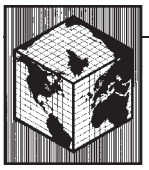
For instance, Bill Martin (Dusseldorf, Germany) made the case for why many people now think that the history of life cannot be drawn up as Darwin's simple branching tree: lineages of prokaryotes (simple-celled organisms) form extremely intricate network phylogenies as a result of extensive "lateral gene transfer," a continuous exchange of genes between species. Because the earliest living organisms were all prokaryotes, the base of the alleged evolutionary tree actually looks more like an intricate web. Yan Boucher (MIT) showed how mutation rates and rates of lateral gene transfer vary by orders of magnitude even within prokaryotes, which means not only that prokaryotes evolve differently from eukaryotes (more complex-celled organisms), but that in fact there are a variety of ways in which evolution proceeds even within microorganisms, a much more complex picture than Darwin would have envisioned. Jeff Lawrence (Pittsburgh) elegantly explained why prokaryotic phylogenetics still gives the appearance of a tree even though there is rampant lateral gene transfer. The data show that gene transfer is not isomorphic (i.e., any given species of bacteria is not equally likely to receive genes from any other species). This leads to the formation of clusters of more closely related species that can be erroneously represented by tree-like phylogenies, even though the underlying evolutionary mechanism is not tree-generating.

This is all solid scholarship at the border between philosophy and evolutionary biology. But I have learned to expect that any serious discussion among biologists questioning one or another previously assumed notion within their field is bound to be picked up in the blogosphere by creationists and twisted accordingly. Sure enough, on November 23, 2008 (two weeks after the Pittsburgh meetings), Discovery Institute's Paul Nelson linked to my online commentary of the tree of life discussion, suggesting that the whole idea of "common descent" is now in doubt, which, Nelson says, is why he can't manage to finish his long-awaited book, apparently titled *On Common Descent*, that he has been working on since 1998.

There are two major points that ID supporters like Nelson just don't seem to get: first, common descent is not synonymous with a tree of life. Even if, as is becoming increasingly likely, the early stages of life's evolution were characterized by widespread horizontal gene transfer and some of this gene transfer continues today, we may still descend from a single, original ancestor. The picture of evolving life becomes more complicated than a branching tree, but it is still evolution by common descent.

Second, nothing dramatic hinges on the possibility that life started out with several parallel events instead of just one. We would still have evolution and (largely) common descent of the forms that survived the initial stages of the process. Darwin would have been wrong in some of what he said, but we knew that already (he didn't get his theory of heredity right, for instance). To say that the new discoveries undermine Darwinism is as anachronistic as saying that the Standard Model in physics undermines Newton. Of course it does, in the trivial sense that science makes progress and that our understanding of the world improves accordingly. As a commentator on Nelson's own blog aptly put it: "This . . . provides a striking refutation of the notion that evolutionary biologists are a bunch of hidebound dogmatists who refuse to consider anything that contradicts their ideology. Instead we see an initially radical idea—a network of life instead of a tree—gaining acceptance as the evidence for it mounts. The lesson for ID supporters is clear: if you want ID to become part of the mainstream of science, then make a genuine scientific case for it. Scientists will listen if the evidence is there and the arguments are valid." Indeed. □

Darwin famously drew only one figure in *The Origin of Species*, which was published 150 years ago: a tree-like structure representing the idea of common descent. The "tree of life," as it has come to be known, is an iconic picture in modern biology.... But what if the history of life does not actually look like a branching tree?



Ghostly Molds

How to make a plaster cast of your hand, even if you are not a spirit

Since the early days of Spiritualism, when mediums began producing physical phenomena, paraffin-wax molds supposedly modeled around materialized "spirit hands" during séances were considered some of the best pieces of evidence of the paranormal.

Some of these molds, in fact, seemed to possess the characteristics of "permanent paranormal objects." The empty paraffin molds found at the conclusion of séances, it was thought, could still be intact only because the hands around which the wax solidified had dematerialized.

Molds have not always possessed these characteristics, and even the celebrated medium D.D. Home warned against fraudulent mediums who produced these phenomena by casting molds of their own hands or smuggling prepared ones into the séance room. After a period in which interest in these phenomena faded away, they made a comeback in the Roaring Twenties with Polish medium Franek Kluski and others, and the general public became aware of their existence thanks also to articles in popular magazines such as *Scientific American*.

Some of the plaster casts of these molds are still preserved at the Institut Mètapsychique International in Paris (www.metapsychique.org), a fact that in part explains why the interest in the phenomena periodically resurfaces.

Alternatives to the Paranormal

Many (e.g., Coleman 1994a; 1995a) have pointed out various possible natural explanations accounting for the "ghostly mold" phenomena. Dr Robin Tillyard (1926), for example, suggested the following: a tourniquet is fastened to one arm, and the hand is allowed to swell; after this, the swollen hand is immersed into the paraffin and then into cold water. The tourniquet is then removed and the arm is lifted upward, in order to allow the blood to flow, until the swelling has gone down. The hand, having recovered its original size, will allow the paraffin glove to slip off easily (especially if the hand had previously been smeared with glycerol).

A different procedure for casting spirit molds using normal means requires only one rubber glove perfectly imitating the hand's features. The supporters of this method agree that it is possible to reproduce hands of different sizes and shapes and that the glove might be easily hidden on the medium's body. To obtain such a glove showing the hand's fingerprints and its distinctive lines, one should first impress a real hand on dental wax, which allows a much sharper outline of the skin's texture than plaster. This imprinting will at once be used as a mold for making a rubber glove showing all the typical marks of a real hand. This hypothesis, however, appears weak.

It is generally recognized that the paraffin molds are "first generation" imprints; instead, following this technique, they would be "third generation" imprints: first a negative in dental wax, then the rubber glove from this mold and finally the mold of paraffin over the glove. The end result would probably show surface defects accumulated along the way.

Tests of this hypothesis, carried out by Gustave Geley (1923) with thin rubber gloves inflated or filled with water and then suspended in a basin containing paraffin, produced imprints showing the typical sausage-shaped fingers, clearly revealing that they were made with an inflated rubber glove.

Geley's test doesn't rule out the possi-

Along with my friend and colleague Luigi Garlaschelli, I decided to put my hands to the problem. Literally.

Massimo Polidoro is an investigator of the paranormal, author, lecturer, and cofounder and head of CICAP, the Italian skeptics group. His Web site is at www.massimopolidoro.com.

bility of obtaining convincing spirit molds by using gloves made with elastic and thicker materials, carefully crafted and not overly filled with water or air. However, in any case, the entire procedure appears unnecessarily complicated.

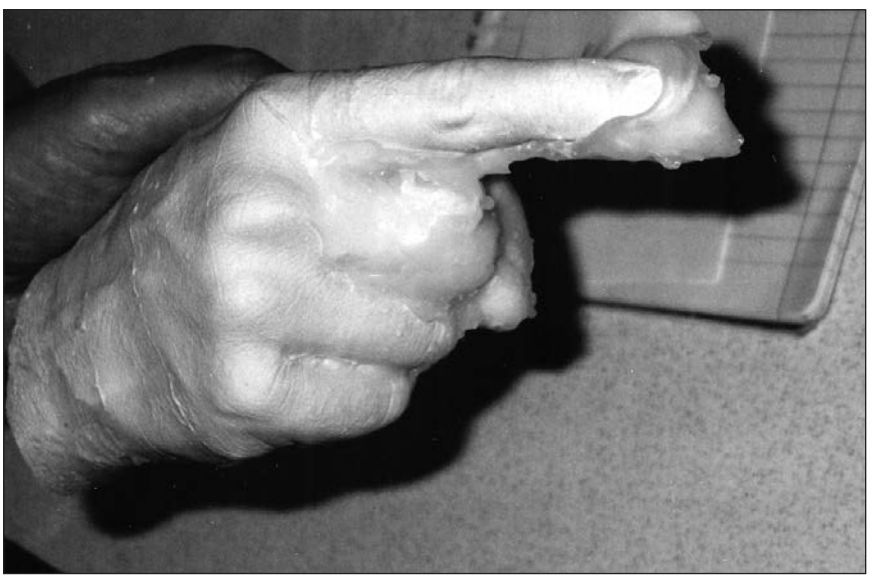
Here is an example of how certain books encouraging the belief in spiritualism claim the impossibility of obtaining molds by natural means:

> The molds were shown to Gabrielli, a professional modeler, who stated that they could never have been forged with an ordinary process, as a human hand would have broken a paraffin glove when slipping out of it. A real hand coming out of a paraffin glove just one millimeter in thickness, like the gloves obtained at the IMI, is not possible, nor would it have been possible with a thicker glove, in that the palm of a hand is much larger than the wrist. The hand therefore would have had to break the glove to be able to slip it off the wrist. Contrariwise, the paraffin gloves are not damaged or broken at all. The only acceptable explanation was that "the hand must have materialized into the glove itself" (Giovetti 1988).

Or, again: "This double-handed mould is perhaps the clearest evidence for the impossibility of a normal removal of the genuine mould obtained from the paraffin" (Geley 1923).

In reading these observations and comparing them with all the possible solutions suggested by both skeptics and believers in Spiritualism, it turns out that only one solution gives a convincing, rational explanation for the molds created by Kluski: it is simply the production of wax-molds directly from one's hand, as also pointed out by Coleman (1995a).

The author making "spirit molds"



Even with his finger pointed, the author was able to remove his hand from the mold without breaking it.

Experimenting with Ghostly Hands

Along with my friend and colleague Luigi Garlaschelli, I decided to put my hands to the problem. Literally. We decided to make molds of our own hands to test how difficult this really was. Strictly following Geley's instructions, we prepared two basins (each with a diameter of ten inches): one with hot water (approximately 5 liters at 55° C), in which we poured a layer of molten paraffin (approximately 1 kg, previously melted in a pan with boiling water on a kitchen stove) and the other with cold water (5 liters), which we later used to immerse our hands and allow the paraffin to solidify. In turn, we immersed our hands first in the basin filled with paraffin and then in the one containing water.

We gave our hands different shapes: one open hand, one fist, another with two fingers shaped like a V, one with a finger pointing out (a form which, according to Geley, should be considered "perhaps the clearest evidence for the impossibility of a normal removal of the genuine mould obtained from the paraffin"), and one with two hands clasped. Regarding this shape, supporters of Spiritualism were categorical: "By

no means could one have made only one paraffin mould of the two hands of a living person clasped in such a way" (Dettore 1981).

In all of these cases, we were easily able to make some fairly thin molds (a couple of millimeters thick) just by immersing the hands one or two times in the basin with the paraffin. But our most significant result was that in every instance we managed to remove our hands from the solidified paraffin glove without breaking it. In fact, it can be noted from the photos that the wrist in

One of Frank Kluski's spirit molds found at the Institut Mètapsychique International in Paris.

some of the molds that we have obtained is notably narrower than the width of the hand. This outcome is attainable by simply removing the hand very carefully.

Pictures in some books on Spiritualism illustrate models reproducing parts of the human body that look like sculptures. These illustrations are followed by captions with statements like: "These shapes could not be removed from a mould without it being broken," leading one to believe that this is the case. Actually, it is not the plaster cast that has to be removed from the thin wax mold, which really would be impossible to do without breaking it. One almost forgets that what has to be removed is a living hand, possibly the best-suited object to slip out of a mold without damaging it. In fact, a real hand is even more effective than any other artifice dreamed up to substitute for it. First, the paraffin doesn't stick to the skin, only to quite long hair. Nonetheless, if one moves the fingers very slowly, one will realize that every small bit one pulls out gradually allows the rest of the hand to be removed; it's almost what happens when one pulls off a tight glove.

Later, when we had poured some plaster into a few molds, it turned out that we had made exactly the same copies as Kluski's, which are kept at the IMI (photo at left). The hands we obtained feature all of the hands' typical lines and also a few hairs stuck here and there. To convert a mold into a plaster cast, one has only to pour liquid plaster slowly into the mold. When the plaster is dry, the outer paraffin glove can be removed, either by scraping it off with the fingers or by melting it in hot water; we preferred to melt it by placing it on a plate inside an oven at 70° to 80° C.

We noticed that the skin's wrinkles in our molds appeared further enhanced; they looked like hands of a person older than the original model. This phenomenon may be caused by either superficial features becoming more noticeable when this is the only information available on the hand—color, movement, etc., being absent—or by the paraffin shrinking while it was getting cold.

With regard to copies from hands smaller than those of the medium—or clearly different—it is well known that previously prepared gloves have been repeatedly found hidden among the medium's and/or other accomplices' clothes (Coleman 1994a; Polidoro 1995). It would not be difficult to conclude, though, that particularly complex molds could have been shaped with extreme care before a séance took place by the medium himself or his accomplices in the dark, jumbled up with other molds forged at the moment of performing the Spiritualist occurrence.

Our experiment, which anyone can repeat at home (plaster and paraffin are usually available in artists' shops), seems to suggest the following conclusions:

1) The claim of the impossibility of removing a hand from a thin paraffin mold without breaking it has once again been disproved; and

2) the claim of the impossibility of removing a hand from a mold given strange shapes (e.g., clasped fingers, a fist hand, V-shaped fingers, etc.), has also been refuted; and

3) the hypothesis claiming the impossibility of removing a hand from a mold narrower at the wrist has been disproved.

Our little experiment, then, just happened to confirm Occam's Razor once more: the simplest hypothesis turned out to be the one capable of explaining the phenomenon most completely.

Acknowledgements

Thanks to my good friend and colleague Luigi Garlaschelli, with whom this experiment was conducted (an article about it was written and published in the July 1997 issue [Vol. 62, N. 848] of the *Journal of the Society for Psychical Research*). I also wish to thank Michael H. Coleman and Lewis Jones for their useful suggestions and help.

Note

1. It is interesting that one thesis of Kluski's advocates supporting the authenticity of the phenomenon assumes that the molds the medium obtained during the séances were so tight at the wrist that it was impossible for a hand to come out. Although this statement, as demonstrated, is not true, of all the molds kept at the Institut Mètapsychique International almost none have this characteristic. The majority of the molds either end before the narrow part of the hand or include only the external, visible half of them, never the internal half. The discovery of this fact was just what induced us to try to reproduce the phenomenon of the spirit molds.

References

Barrington, M.R. 1994a. The Kluski hands. *Journal of the Society for Psychical Research (JSPR)* 59, 347–351.

———. 1994b. Kluski and Geley: Further case for the defence. *JSPR* 60, 104–106.

———. 1995. Correspondence. *JSPR* 60, 348–350.

Coleman, M.H. 1994a. Wax molds of 'spirit' limbs. *JSPR* 59, 340–346.

———. 1994b. The Kluski molds: a reply. *JSPR* 60, 98–103.

———. 1995a. Correspondence. *JSPR* 60, 183–185.

———. 1995b. Correspondence. *JSPR* 60, 350–351.

Dettore, Ugo (ed.). 1981. *L'uomo e 1'ignoto.* Milano: Armenia Editore.

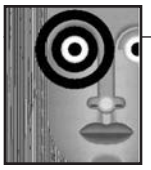
Geley, G. 1923. Materialized hands. *Scientific American* (November).

Giovetti, P. 1988. *I misteri intorno a noi*, Milano: Rizzoli.

Polidoro, M. 1995. *Viaggio tra gli spiriti*. Camago (VA): Sugarco.

Tillyard, R. J. 1926–28. *British Journal of Psychical Research* 1, 340.

Weaver, Z. 1993. Correspondence. *JSPR* 59, 74.



SKEPTICAL INQUIREE
BENJAMIN RADFORD

Curious Contrails: Death from the Sky?

Q: Is someone or something criss-crossing our skies with poisonous vapor trails that fall to Earth, becoming harmful to people or other life?

—D. Phillips

A: We have all seen those white cloudy lines trailing aircraft across the distant sky; most people pay little attention to the contrails, assuming that they are both commonplace and harmless.

Then there're the conspiracy folks. According to myriad conspiracy theories, some of those "harmless" vapors are instead sinister "chemtrails." They are allegedly different from ordinary contrails in that they do not evaporate but instead spread out, causing a haze that eventually settles over populated areas. Some say the cloudy lines are part of government weather-controlling experiments; others say that they're a form of germ warfare. According to Jim Marrs, who claims to be the world's leading conspiracy theory author (or, at least, that's what they *want* you to think!), "the case for the reality of chemtrails is strong."

Physicist Kim Johnson, of the skeptics group New Mexicans for Science and Reason, examined photos and evidence of chemtrails presented to the New Mexico Attorney General's Office. Johnson concluded that "there is no evidence that these 'chemtrails' are other than expected, normal contrails from jet aircraft that vary in their shapes, duration, and general presentation based on prevailing weather conditions. . . . When a jet engine burns its fuel, the major byproduct is water vapor. When the exhaust passes over the rear stabilizer of an aircraft, the tips or ends of the stabilizer cause the exhaust to expand rapidly. When it does, the temperature decreases rapidly within a turbulent flow, and ice crystal formation is forced. Generally, this makes it look as if the jet were spraying a cloud from the ends of the stabilizer."

Marrs disputes the scientific explanation, writing in his 2008 book *Above Top Secret* (published, ironically, by The Disinformation Company),"Chemtrails often occur at altitudes and in conditions where it would be impossible for a contrail to form." As evidence of the threat posed by chemtrails, Marrs points to a 2007 "investigation" by a television station in Louisiana, KSLA. Investigative reporter Jeff Ferrell tested water captured under a crosshatch of alleged chemtrails. According to Ferrell, "KSLA News 12 had the sample tested at a lab. The results: high level of barium, 6.8 parts per million, (ppm). That's more than three times the toxic level set by the Environmental Protection Agency."

Scary, isn't it? Except that SI contributing editor David E. Thomas, a physicist, took a closer look at the TV report. As Thomas notes, "The actual video clearly shows 68.8 µg/L (micrograms per liter), or 68.8 ppb (parts per billion). . . . 68.8 millionths of a gram per liter corresponds to 68.8 parts per billion. . . . Ferrell overestimated the amount of barium in the test report by a factor of 100. . . . The test result was not 'three times the toxic level set by the EPA'; it was around thirty times *less* than the EPA's toxic limit." Apparently a big chunk of Marrs's "strong evidence" for chemtrails is simply the result of a TV reporter's poor math skills. Ooh, awkward—unless, of course, those who devised mathematics were in on it with their suspicious basic math and tiny percentages!

There's also the question of what possible purpose the contrails (er, chemtrails) would serve. As Bob Carroll notes in *The Skeptics Dictionary*, "Any biological or chemical agents released at 25,000 feet or above would be absolutely impossible to control, making any measurement of effects on the ground nearly impossible. . . . Such an exercise would be pointless, unless you just wanted to pollute the atmosphere. And where is the evidence of the illnesses being caused by these agents?"

Alas, conspiracy buffs have no answers for these fundamental questions. It's easier (and much more fun) to just sit back and wonder what secret government experiments we are being exposed to that "they" aren't telling us about. □

References

Carroll, Robert. 2007. Chemtrails (contrails). Available online at www.skepdic.com/chemtrails.html.

Johnson, M. Kim. 1999. Chemtrails analysis. *NMSR Reports*, 5(12), December.

Marrs, Jim. 2008. *Above Top Secret*. New York, NY: The Disinformation Company.

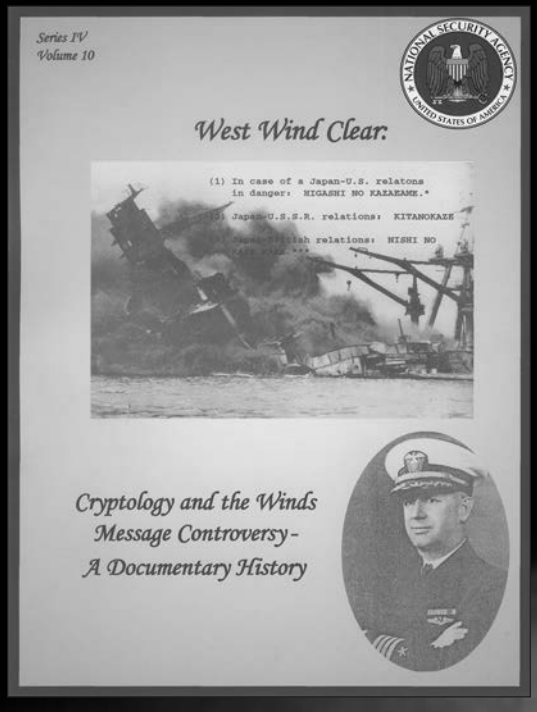
Thomas, David. 2008. "Chemtrail fears thrive on Internet." Available on the Web site for New Mexicans for Science and Reason at www.nmsr.org/chemtrls.htm.

Benjamin Radford is managing editor of the SKEPTICAL INQUIRER. His first book, co-authored with Bob Bartholomew, was Hoaxes, Myths, and Manias: Why We Need Critical Thinking.

The Pearl Harbor 'Winds Message' Controversy: A New Critical Evaluation

KENDRICK FRAZIER

A new critical investigation by the National Security Agency confirms that a Japanese so-called 'Winds execute' message was not heard until hours *after* the attack on Pearl Harbor began on December 7, 1941, and, in any event, contained no actionable intelligence.



WEST
WIND
CLEAR

It is not every day that one receives a report in the mail from the supersecret National Security Agency. NSA is the U.S. intelligence agency responsible for the collection and analysis of foreign communications and foreign signals intelligence. And when the report investigates the history of one of the long-disputed contentions about the worst war of the twentieth century, it deserves special attention.

The Japanese attack on Pearl Harbor on December 7, 1941, continues to inspire suspicion in some quarters that the U.S. knew it was coming. Some revisionist and conspiracy writers, historians, and critics of the Roosevelt administration contend that the U.S. intercepted a Japanese message that was a clear warning of the impending attack on the U.S. fleet at Pearl Harbor. Some further contend that this so-called "Winds Message" had been revealed to senior American military and civilian leaders. The implication is that the attack might therefore have been prevented.

The Japanese attack on Pearl Harbor on December 7, 1941, continues to inspire suspicion in some quarters that the U.S. knew it was coming. Some revisionist and conspiracy writers, historians, and critics of the Roosevelt administration contend that the U.S. intercepted a Japanese message that was a clear warning of the impending attack on the U.S. fleet at Pearl Harbor. The report's authors debunk that view.

The story long ago acquired near-mythic status in some circles and has never quite gone away. This group of believers may even have grown in recent years due to the proliferation of Web sites on the Internet with entries about the Winds message.

Historians Robert J. Hanyok and the late David P. Mowry of NSA's Center for Cryptologic History have now published a new, detailed documentary history of the Winds message controversy in an attempt to clear up the issue and provide source documents for historical scholars and researchers. NSA recently issued the 327-page report ("West Wind Clear: Cryptology and the Winds Message Controversy"), which includes images of all the standard critical documents—as well as many never before seen. The authors debunk the view that a clear warning message was monitored before the attacks.

Hanyok told the SKEPTICAL INQUIRER that he believes his report "will dispel any further reference to a 'Winds execute' message being heard before the attack," at least in conventional and academic circles. He says he holds few such hopes regarding most conspiracy-theory bloggers, unless they actually read the report. "Some conspiracy buffs might change their minds if they read my book."

In a foreword, NSA historian David A. Hatch says Hanyok and Mowry "have made a significant contribution to our knowledge and understanding of two of the event's controversies, the Winds Message and the state of U.S. communications intelligence prior to the Hawaiian attack."

Japan's coded Winds message was intended by the Japanese foreign ministry as an emergency method to alert Japanese diplomats abroad that relations between Japan and the U.S., Great Britain, or the Soviet Union were about to take a downturn. They could then destroy cryptographic materials or sensitive messages.

One method involved placing innocuous-sounding phrases about the winds in weather forecasts transmitted by short-wave radio. For example, "Nishi No Kaze Hare [West Wind Clear]" repeated twice in the middle and twice at the end of the daily Japanese-language short-wave voice news broadcast meant Japan-Great Britain relations were in danger. The phrase "East Wind Rain" signaled damage to U.S. relations. The U.S. intercepted and decrypted the late-November 1941 messages giving these meanings and instructions—as had Great Britain and Australia. Allied monitoring stations were then tasked to search for and monitor any messages bearing these phrases.

Many scholars and researchers have been skeptical or critical of the various revisionist or conspiracist claims revolving around the eventual Winds execute message. Some suggest that the claims are based on a selective reading of testimony and evidence that subsequently surfaced (eight investigations into the Pearl Harbor attacks ensued, from 1942 to 1946). Hanyok and Mowry thought this material might allow them "to examine important aspects of the Winds message story in a deeper fashion than before."

On December 7 in Hawaii, at 1:32 PM, Honolulu time, five

Kendrick Frazier is editor of the SKEPTICAL INQUIRER.

出门思旧乡除倭里宦昨日今如何四月南风临洮昔日长城战戚言意气高笑出匹今古白暮还见嘶马出门思旧乡除倭里宦昨日今如何四月南风临

and a half hours *after* the attacks began, a monitoring station on Hawaii heard a Japanese-language news broadcast from Tokyo breathlessly describing the day's attacks by Japanese forces, including a "death-defying raid upon the American naval and air strength in the Hawaiian area." The announcer then interrupted with a weather report: "West Wind Clear" (relations with Great Britain are in danger). He repeated the phrase and did so twice more at the end of the program. This Winds execute message was also monitored at Portland, Oregon, at 7:02 PM, Eastern Time. It also was: "West Wind Clear." Again, this was hours after the attack. The code phrase referencing relations with the United States was absent from these messages.

Hanyok and Mowry conclude that the Winds message was neither actionable intelligence nor a useful war warning. "A Winds Execute message was sent on 7 December, 1941," the authors say. "The weight of the evidence indicates that one coded phrase, 'West Wind Clear,' was broadcast according to previous instructions some six to seven hours after the attack on Pearl Harbor." They say it is possible that a British site may have heard a broadcast one to two hours after the attack, "but this only substantiates the anticlimatic nature of the broadcast" (p. 88).

"From a military standpoint, the Winds coded message contained no actionable intelligence either about the Japanese operations in Southeast Asia and absolutely nothing about Pearl Harbor. In reality, the Japanese broadcast the coded phrase(s) long after hostilities began—useless, in fact, to all who might have heard it."

They further find that the controversy was in fact an artificial one, pumped up by misunderstandings and the imaginings of one of the key participants, whose narratives "ranged so far from the documentary evidence and the memories of all the other participants that it was completely detached from actual events." And they say revisionist and conspiratorial writers since then have further strayed from the documented truth.

"There simply was not one shred of actionable intelligence in any of the messages or transmissions that pointed to the attack on Pearl Harbor" (p.95).

The "primary, and almost exclusive, source fueling these claims of a conspiracy surrounding the Winds message," say the authors, was Captain Laurance Frye Safford, the founder and first commander of the U.S. Navy's code-breaking unit, OP-20-G. Safford first publicized his views in early 1944 in the Hart Inquiry, the second of the eight investigations after the attack. He repeated his story in Army Board and Navy Board investigations later that same year. He was well regarded within the cryptologic and intelligence communities and therefore taken seriously.

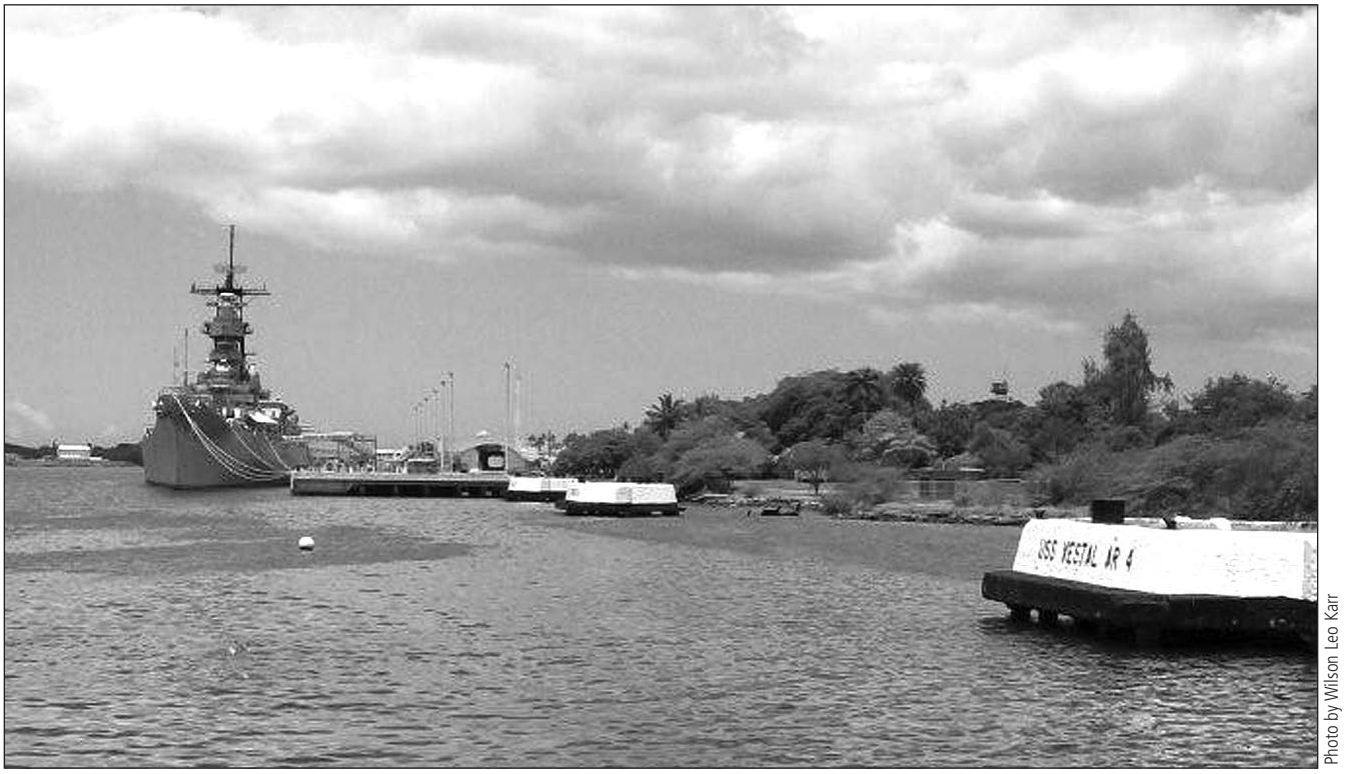


Photo by Wilson Leo Karr

Battleship Row, where the most damage occurred during the attack on Pearl Harbor. The USS *Missouri*, at left center, was damaged during the attack.

In their report's final section, "The Winds Message and the Historical Process," Hanyok and Mowry are highly critical of Safford and later conspiratorial writers.

"The 'conspiratorial' version of the Winds incident was solely the product of Captain Laurance Safford's imagining of

events that had occurred prior to Pearl Harbor in the Washington, D.C., offices of naval and army intelligence," say the authors (p. 99).

"Put to the test, though, Safford's narrative about the Execute message simply failed to stand up to cross-examination. The Joint Congressional Committee shredded Safford's story. The committee reduced it to the collection of unsubstantiated charges that all along had been its foundation. The documentary evidence he said was available simply did not, nor did it ever, exist. In truth, Safford produced nothing upon which any further investigation could proceed." They say the most charitable assessment of his actions was that he was "mistaken."

The story should have ended there, the authors say. But thirty-four years after the congressional committee report in 1946, a few private scholars resurrected Safford's allegation of a conspiracy and with it the whole Winds controversy. These writers "inverted the normal rules of evidentiary argument," insisting that "the government had yet to disprove Safford's charges regardless of the fact that he never had produced any evidence to substantiate them thirty-some years earlier," say Hanyok and Mowry (p. 99).

"The scholars and researchers who championed Safford's version of the controversy abandoned the rigorous evidentiary requirements of the historical profession in order to advance their thesis. . . .

"Safford's case was built on mistaken deductions, reconstructed, nonexistent documents, a mutable version of events, as well as a cast of witnesses that Safford conjured up in his imagination.

"In the end, the Winds message controversy was and remains an artificial historical phenomenon. . . . The artificial controversy that grew around the Winds message never advanced historical knowledge of the events of early December 1941. In fact, the Winds controversy distracted investigations and later historical analyses from far more important issues about the attack on Pearl Harbor." These include, the authors say, "the fundamental organizational and operational shortcomings of American cryptology" and the "arrogant dismissal by American military and naval leaders of a Japanese capability and willingness to conduct such an operation."

"That the Winds controversy persisted over decades is more a result of the misplaced belief by some that history is controlled by conspiracy than history being the product of human folly" (p. 100).

* * *

Hanyok told the SKEPTICAL INQUIRER that if there is anything he wanted to add to his book it would have been on "Captain Safford's reason behind his dogged persistence in pushing his conspiracy theory." Says Hanyok: "I came across some additional material after my book was at the printer. Safford firmly believed that radio intelligence could discover what the Japanese were up to. He was absolutely certain that the intelligence that tipped off the attack on Pearl Harbor was somewhere in the files of the Navy or Army. When he could not find what he was sure existed, he began to suspect that the files had been picked. So the vague sense of conspiracy came first. Then he began to fit the 'pieces,' no matter how untenable they were, to the story."

He says some "conspiracy bloggers" have already dismissed his book as the work of "court historians." This, he says, is "a curious insult considering that I blew the whistle on the Gulf of Tonkin coverup!" Says Hanyok: "This group is so committed that they will never change their collective mind. Believing in a conspiratorial view of history is a comfortable and comforting ideology." □

Note

West Wind Clear: Cryptology and the Winds Message Controversy—A Documentary History. By Robert J. Hanyok and David P. Mowry. United States Cryptologic History, Series IV: World War II, Volume 10. Center for Cryptologic History, National Security Agency, Ft. George Meade, MD 20755-6886, 2008. The report was Hanyok's final publication for the CCH before his retirement in August 2008 from a long career in government; Mowry died before its publication.

Lessons about Burdens on American Cryptology

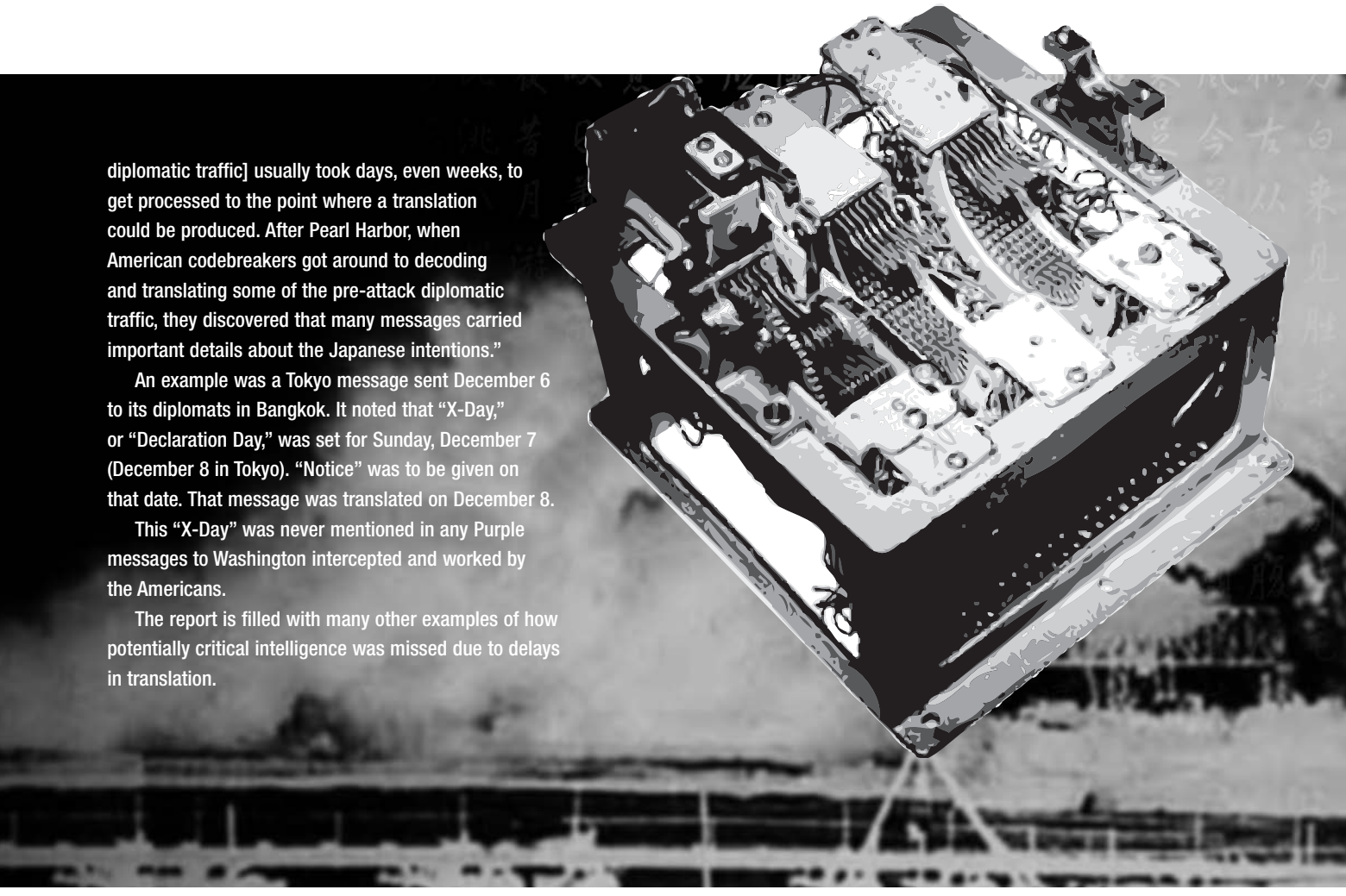
The Winds message controversy does have lessons about burdens and pressures on pre-war American cryptology, say the authors of the West Wind Clear report.

"By December 1941 American cryptology was a system that was stretched to the limit and pushed in too many directions," they write. The American intelligence people had "conflicting missions" and too "few resources." The orders to monitor commercial Japanese broadcasts for a Winds execute message was just one more burden—"one more apple of chaos tossed into an already turbulent crisis."

"The result of this skewed emphasis was that many messages encrypted in cryptographic systems other than Purple [Japan's high-level cipher machine used for

门思旧乡除侯 里宿昨日今如何四月高风临洮著日长城战戚言意气高笑坐足今古白暮还见嘶马出门思旧乡除侯 里宿昨日今如何四月高风临

Inside the shrine room of the USS *Arizona* memorial in Pearl Harbor.

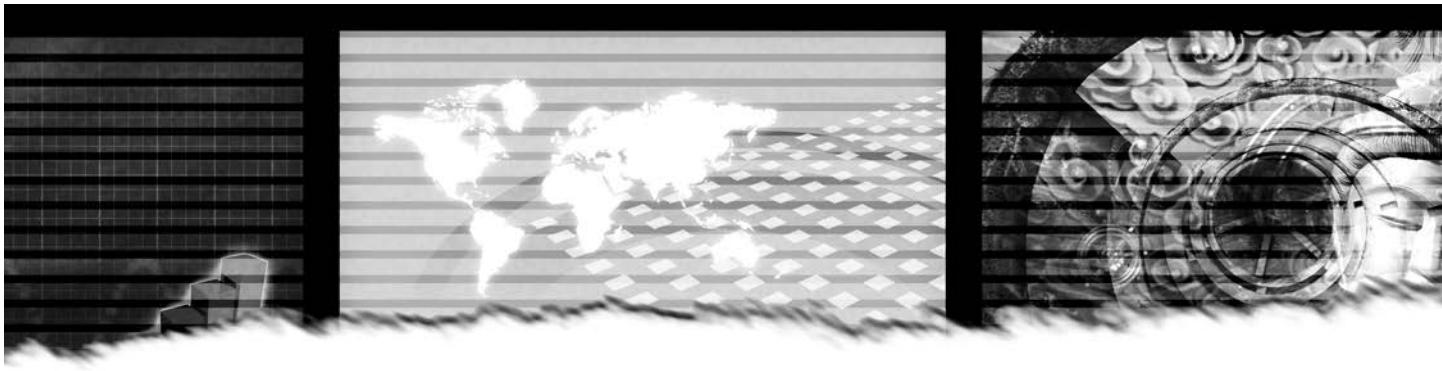


diplomatic traffic] usually took days, even weeks, to get processed to the point where a translation could be produced. After Pearl Harbor, when American codebreakers got around to decoding and translating some of the pre-attack diplomatic traffic, they discovered that many messages carried important details about the Japanese intentions."

An example was a Tokyo message sent December 6 to its diplomats in Bangkok. It noted that "X-Day," or "Declaration Day," was set for Sunday, December 7 (December 8 in Tokyo). "Notice" was to be given on that date. That message was translated on December 8.

This "X-Day" was never mentioned in any Purple messages to Washington intercepted and worked by the Americans.

The report is filled with many other examples of how potentially critical intelligence was missed due to delays in translation.



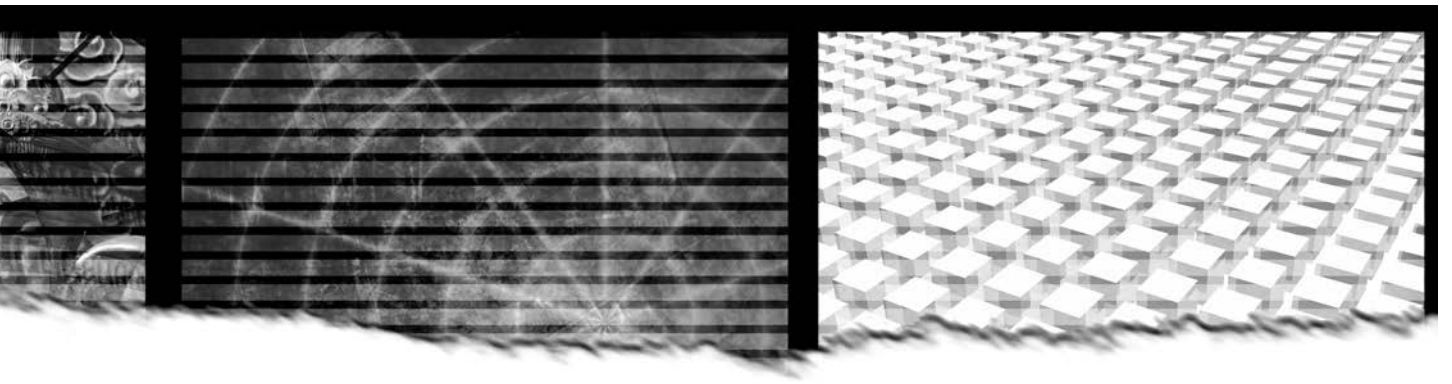
Science and Antiscience in America

Why It Matters

If science doesn't inform the decisions we make, the consequence is that people suffer.

ELIZABETH SHERMAN

Every time I fly, I do something that ensures the plane won't crash. Just as I am stepping aboard the aircraft, I touch the outside fuselage next to the door. And then the plane doesn't crash! It's a causal gesture. Every time I've flown I've touched the outside of the plane, and it hasn't crashed. One event reliably preceding another proves that the first causes the second, right? Well, of course, intellectually, I know that my touching the plane doesn't ensure that it won't crash. After all, I am a scientist and I have been studying how the material world works all my professional life. Having said that, do you think I can ever bring myself to abandon my touching-the-fuselage practice? Well, what's the harm? So what if science doesn't inform my behavior?



Yet as a biology professor, I am concerned that science does not inform our behavior, not just as individuals but as a society. I can recall how this concern captured my attention with the urgency it now has for me: I was listening to the then-president of the United States on the news (George Bush), and he suggested that the jury was still out on evolution. And I began to push myself to articulate *why* I was so distressed. Each time I answered myself, I pushed again: so what? I answered, again with "well, so what?" and again, "so what?" So what if science doesn't inform the decisions we make as a country, a people, a world?

The answer is that people suffer.

The absence of an understanding of how the AIDS virus is transmitted, for instance, has contributed to countless deaths and millions of children being orphaned in Africa. Scientists had been predicting that a Katrina-like storm was bound to hit low-lying areas in the U.S., and we now know the consequences of having ignored that prediction. Now scientists are concerned that global climate change will have terrible consequences for people living in poor countries.

One obstacle to people's understanding of science is that we have a tendency to infer that one event, A, *causes* another, B, simply if B follows A. Moreover, we want knowledge to provide us with certainty. Science doesn't always confirm causality and can't always provide certainty. We don't know when the next Katrina-like storm will occur or when or what the next pandemic will be. But these assumptions about direct causality and certainty speak of a misunderstanding of science.

People seem predisposed to infer causality. I've wondered how this predisposition might have come about. Biologically speaking, how might it have served our fitness as we evolved? Consider this: which is more risky, failing to attend to a true positive (*Uncle Bob ate that mushroom and died*) or attending to a false positive (*When I touch the outside of a plane, it doesn't crash*). Attending to a false positive might not hurt me too much (that is, touching a plane before I get on is not particularly detrimental to me) but ignoring a true positive? (Oops, I ignored the fact that Uncle Bob died after eating the mushroom, and I then ate the mushroom and also died). So perhaps we are predisposed to infer causality. It serves us to make associations. If we happen to goof on a false positive (the airplane) we can still reproduce. But if we don't make the association when someone eats a mushroom and dies, then we may die too. So on average, it probably helped us to infer causality.

But what's the harm in inferring causality at the least provocation? Recently, I read a report noting that some parents in Indonesia have inferred a causal relationship between polio immunization and contracting the disease. In one instance, an Indonesian mother brought her child to be immunized and a day later he developed polio. The most likely explanation is that this child already had the virus incubating in his body prior to the vaccination and was vaccinated too late. But with-

Yet as a biology professor,
I am concerned that science does not inform our behavior,
not just as individuals but as a society.

Elizabeth Sherman is a professor of biology at Bennington College, Bennington, Vermont, and teaches classes in animal behavior and physiology. Her research focuses on the responses of amphibians to environmental stresses. E-mail: Sherman@bennington.edu.

out understanding how the disease is contracted and how the vaccine works, the mother's logic made sense. She discouraged her neighbors from immunizing their children, which will contribute to the spread of the disease.

Yet science relies on the association of events to make sense of the universe. Once we find an association or a correlation, we can begin to look for causality—the mechanisms underlying a phenomenon. For instance, scientists noticed an association between the acidification of lakes in the Northeast and the loss of many aquatic species of animals. And now, we are beginning to uncover the causal relationship, the mechanisms by which the acid content in lakes hurts animals.

The absence of certainty also contributes to a misunderstanding of science. Not every human being who smokes cigarettes will develop lung cancer; we can't even predict (at least not yet) who will. So what do we know? Of thousands of people who smoke, some proportion of them will die prematurely as a consequence. We can only move closer to the truth of how the material world works through the play of large numbers, and thus probabilities.

Science requires openness to possibilities and skepticism about how things work. What were your hypotheses? By what observations or experiments did you test these hypotheses? What is your evidence?

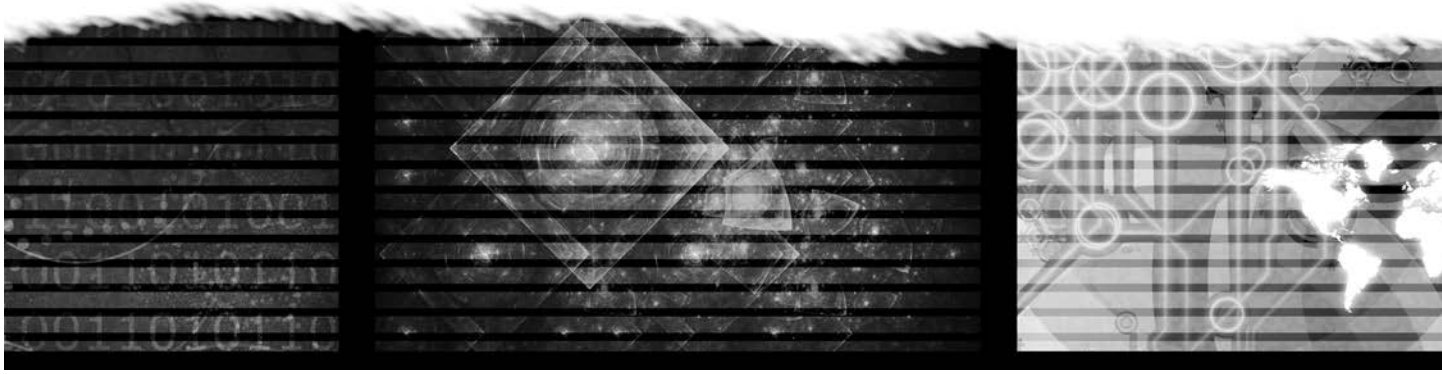
The scientific method is such a powerful process because it is self-correcting: a hypothesis not supported by evidence doesn't hang around long. Scientists are constantly testing their ideas and those of others with the bar set pretty high for what it takes to be persuaded. Just recently, a Nobel Prize-winning scientist retracted a paper she co-authored because she could not replicate the results.

Science is powerful because it accurately predicts events from the virtually certain (if I drop a ball from a building, it will fall to earth) to the probabilistic (people who don't smoke are likely to lead healthier lives than those who do).

A misunderstanding of science is pervasive in many institutions that shape how we see and act in the world. There are too many such institutions to mention in this essay, so I'll just highlight a few.

The scientific method is such a powerful process because it is self-correcting: a hypothesis not supported by evidence doesn't hang around long. Scientists are constantly testing their ideas and those of others with the bar set pretty high for what it takes to be persuaded. Just recently, a Nobel Prize-winning scientist retracted a paper she co-authored because she could not replicate the results.

There is compelling evidence that the Bush administration manipulated data and coerced scientists when the data were not consistent with the administration's view of the world. I was gratified when President Obama stated that we would "restore science to its rightful place," in his inaugural address. Nevertheless, we must attend to the consequences of the Bush administration's disregard of evidence in its decision-making process. In February of 2004, sixty-two leading scientists (including Nobel laureates, National Medal of Science recipients, and advisors to the Eisenhower and Nixon administrations) criticized the Bush administration for its science poli-



cies. Their declaration includes the statement that "When scientific knowledge has been found to be in conflict with its political goals, the administration has often manipulated the process through which science enters into its decisions." For example:

- After Bush took office, the Department of Health and Human Services deleted Web site references to the efficacy of condom use in the fight against the spread of AIDS
- NASA scientists have reported that they have been pressured repeatedly by Bush appointees to alter or delete climate change findings in their reports
- The Bush administration interfered with stem-cell research, which could have facilitated the development of treatments to ameliorate Parkinson's disease and diabetes

So what if science doesn't inform our decisions? People suffer.

Alas, the way in which science is often taught at colleges and universities can contribute to its misunderstanding. Too often, science is presented as a disembodied collection of facts. How many of us had science classes that failed to engage us in the actual enterprise? How many science classes insist that students generate their own questions, design and carry out appropriate experiments, and grapple with evidence?

I also have concerns regarding the ways in which the media report on scientific issues. For example, in the fall of 2005, the Dover (Pennsylvania) Area School Board passed the following resolution: "Students will be made aware of gaps/problems in Darwin's theory of evolution and of other theories of evolution including, but not limited to intelligent design." The school board further required that science teachers read a kind of evolutionary disclaimer to their biology classes. The board was sued by a group of parents upset by this decision, and the case was widely reported for some time. Various print, TV, and Internet media interviewed one person who was in favor of the resolution and one who was not, as though both points of view reflected equally legitimate scientific understandings. At the time, I was teaching a course called "Science and Antiscience in America," and I asked my students what they thought about this tendency of the media to present all sides (or more typically "both sides") of an issue, particularly as it pertains to scientific questions. Mostly, my students thought that it was an appropriate way to cover an issue in order "to be fair." I asked them to suppose the story was about teaching that the world was flat versus round? "Oh, that's different," they'd say. Yet the preponderance of evidence for the *fact* of evolution is as robust as that for a round earth.

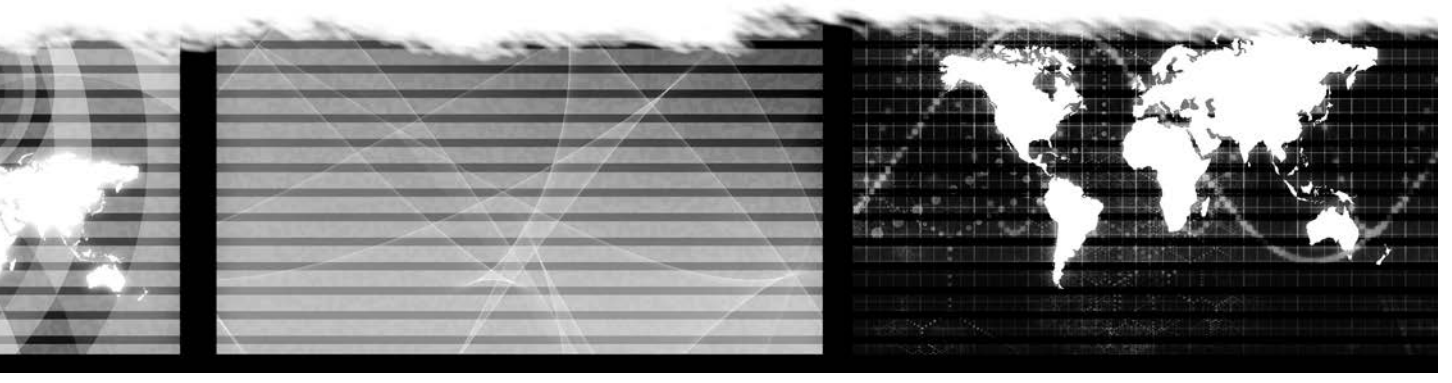
It is, at times, difficult for any of us to confront our own biases and examine them in light of evidence. Many of my students had no difficulty disparaging the folks who eschew evolution. But some of them bristled when I suggested that dismissing science as simply "a vehicle for continued male domination" is equally problematic. When you begin your inquiry with the answer rather than the question, whether the answer is "God did it" or "Western intellectual thought is simply a way to ensure the power of white men," then it isn't inquiry at all; it's dogma.

Finally, I am deeply disturbed that roughly half of Americans don't accept evolution. (I don't like to use the phrase "believe in" evolution; it's like choosing whether or not to believe in gravity.) Darwinian evolution (including the modifications biologists have brought forth over the years) is the only explanation that scientists have found for the relevant data. The wealth of data is so vast, evolution explains these data so well, and nearly the entire community of professionally trained biologists is so persuaded by this explanation that it is unlikely any other explanation will come along to supplant it. However, as good scientists, we remain open to the possibility of a better idea developing to explain the data. Until it does, there is no scientifically valid reason to hold any other view than that our species (and all other species of animals, plants, fungi, and bacteria) have arisen on the planet through the process of evolution.

But more than that, this denial of evolution speaks to an anti-intellectualism, a brand of antiscience that contributes to human suffering. If people can deny evolution, which is well supported by scientific evidence and widely accepted by the professional scientific community, then they will deny any scientific findings they dislike. The same methods and insights that have informed how scientists understand the movement of the planets, how molecules work, and what medical remedies are most effective have also informed our understanding of evolution. We can choose to cherry pick only the data that support a particular bias about how the world works, but how does that help us if the world does not work that way?

Science is a way of asking testable questions about the material world; the knowledge we have gained is imperfect, provisional, and can be derived only through the play of large numbers, and yet it is the best we can do in addressing certain problems. Einstein expressed this view most eloquently:

> All our science, measured against reality, is primitive and childlike—and yet it is the most precious thing we have. □



What Open-Mindedness Requires

If we are to steer a course between being obstinately defensive and wantonly credulous, it is important to understand what open-mindedness requires. Here are ten aspects of being open-minded.

WILLIAM HARE

Open-mindedness has been recognized as an intellectual virtue throughout the history of philosophy. It can be seen emerging as an epistemic ideal in the Socratic notion of following the argument where it leads, whatever the conclusions may be. It is implicit in Leibniz's advice to avoid dogmatism by trying to see if the view we oppose has merit; it is implicit in Hume's notion of a mitigated skepticism that diminishes the fondness we have for our own opinions; it is reflected in Mill's idea of a standing invitation to the whole world to prove our views unfounded; and it is very much at work in Peirce's conception of the scientific spirit involving a readiness to abandon one's beliefs once experience counts against them. For Dewey, open-

mindedness becomes a central educational aim that serves to prevent beliefs from being asserted dogmatically; for Russell, open-mindedness is a form of critical receptiveness that goes hand-in-hand with a genuine desire for knowledge.[1]

Such an intimate connection between philosophical inquiry and open-mindedness could hardly be otherwise. Philosophy flourishes when arguments are developed and critically examined, and philosophy would vanish if arguments were ignored or silenced. What exactly is it, however, to adopt an open-minded outlook? How much time, for example, should we devote to inquiring into the merits of the view that alien visitors are in our midst or that remote viewing is possible? Should we hesitate before dismissing any idea as absurd or ridiculous knowing that similar claims in the past (about meteorites, hypnotism, air travel, and so on) proved to be erroneous? Is it wise to remain dubious about even apparently well-established scientific theories because science has been wrong before? Should we suspend judgment on all controversial matters until the issue in question is resolved? Must we include intelligent design in the science classroom alongside evolutionary theory to ensure a fair hearing for rival views? Should we pay attention to rumors and conspiracy theories just in case they might be true? Is it important to remind ourselves that cranks sometimes turn out to be unrecognized geniuses? How far should we think for ourselves about matters in which we lack expertise? Should we regard all views as embodying their own truth? Should we avoid concluding that anything is certain? Should we come to any definite conclusions at all?

Such questions are likely to leave us feeling perplexed about the outlook that is appropriate when we encounter new, surprising, or controversial ideas or when we reflect on what we think we know. It is not uncommon to feel torn between the sense that all of our beliefs are tentative and provisional and the conviction that certain claims are nonsensical and utterly spurious. Can we be confident in our beliefs yet avoid the kind of intellectual arrogance that prevents us from acknowledging the possibility of error? Is it possible to recognize that our own views are necessarily vulnerable without concluding that inquiry is pointless? Can we be intelligently critical without becoming pathologically skeptical? Can we be receptive without becoming gullible? How are we to steer a course between being obstinately defensive and wantonly credulous? What, in short, does open-mindedness require? There are several answers.

1. Open-mindedness requires serious consideration of alternative ideas and proposed solutions unless there is already good reason to believe that they have no merit. It may be apparent from previous experience with the source in question, from some contextual clue, or because of the bogus

William Hare is professor emeritus in the faculty of education at Mount Saint Vincent University, Halifax, Nova Scotia, B3M 2J6. His books include In Defence of Open-mindedness *(1985) and* What Makes a Good Teacher *(1993). He co-edited* Key Questions for Educators *(2007). His research interests focus on the intellectual virtues, especially open-mindedness. Email: william.hare@msvu.ca. Web site: williamhare.org.*

nature of the suggestion itself (such as a proposal for a perpetual motion machine) that it would be foolish to give the idea in question any further attention except in an attempt to discredit it or to discover why some might think it credible. Serious consideration of the merits of alternative suggestions requires a readiness to modify or reject one's own beliefs when evidence and argument point to deficiencies in a compelling way—the latter qualification serving as a reminder that we are not required to abandon an idea at the first hint of potential trouble. Finding in oneself the ability and willingness to overcome any reluctance we might feel to critically examine our own beliefs, or to entertain an idea that seems counterintuitive or wildly implausible, is what makes open-mindedness both difficult and admirable.

2. Open-mindedness requires much more than a ready acceptance of new ideas. This popular but over-simplified account fails to emphasize the careful, critical examination of ideas that serves to keep open-mindedness on the straight and narrow. Critical scrutiny, of course, is sometimes misinterpreted and condemned as sheer unwillingness to accept the truth, thus prompting misguided accusations of closed-mindedness. Certainly, criticism can degenerate into a determined refusal to give new ideas a chance, but this danger should not tempt us to drift away from genuine open-mindedness toward an uncritical acceptance of ideas that sets us on the primrose path to gullibility. To err in one direction involves blindness to new ideas; the opposite mistake invites a reckless embrace of nonsense. Open-mindedness requires an attempt to reconcile the tension between the conflicting demands of receptiveness toward new ideas and a critical assessment of those ideas.

3. Open-mindedness requires sincere commitment to the pursuit of truth, without which a concern for evidence and argument and a readiness to revise one's opinion serves no meaningful purpose. Relativism is sometimes mistakenly thought to be implicated in an open-minded outlook, no doubt because relativism adopts a nonjudgmental attitude toward competing views. If relativism means, however, that every view is somehow equally worthy or that all knowledge claims are equally true (since what is true is simply true for someone or some group), it is clear that the ideal of open-minded inquiry is quite incompatible with relativism. If no view is conceivably better than another, there is no reason to examine evidence with the purpose of revising one's opinion. Open-mindedness provides no guarantee, of course, that inquiry will be successful, since even genuinely open-minded reflection can result in error; but the practices associated with open-mindedness (addressing objections, considering new results, trying to falsify our strongest theories, and so on) greatly enhance our prospects of making progress in the direction of truth.

4. The limited extent of human knowledge combined with the possibility of error makes open-mindedness a highly desirable attitude. Open-mindedness does not require, however, that we regard every claim as doubtful; it would be excessively skeptical of me to hesitate over the statement, "I am now sitting here wide-awake writing this paragraph." Open-mindedness does, however, require a general epistemological outlook of fallibilism, a recognition that we are sometimes mistaken. Final truth, as Russell says, belongs to heaven. Truths derived from our best scientific theories, from value judgments we make in controversial cases, and conclusions drawn in complex matters must be seen as provisional. This outlook means that open-mindedness is closely associated with the virtues of intellectual humility and epistemic modesty.

Open-mindedness, in brief, is not an invitation to give respectful and thoughtful consideration to pseudoscience, paranormal claims, Holocaust denial, and all manner of nonsense and flimflam; these ideas have failed the test of critical scrutiny, and rejecting them simply recognizes the outcome of open-minded inquiry.

5. Open-mindedness requires the absence of a dogmatic and rigid stance that dismisses reflection and inquiry as pointless on the grounds that absolute certainty is already at hand; it embraces instead the ideal of an unbiased and impartial examination of arguments and evidence regardless of the direction in which such inquiry leads. None of this, however, implies that open-mindedness requires the absence of conviction and firm belief; what matters is the way in which one's beliefs and convictions are held, namely open to revision in the light of a critical review of whatever is relevant to the assessment of their merits. Open-mindedness does not require that we experience actual doubt about the truth of ideas to which we are drawn; what is required is a readiness to examine such doubts, and the doubts others raise, as they occur. This means that open-mindedness is compatible with a principle of tenacity with respect to

our beliefs; it is perfectly possible, at the same time, for an open-minded person to acknowledge that weaknesses sometimes emerge in views that now seem quite secure.

6. Open-mindedness requires more than purely subjective rationality. It is not enough to take into account what one personally regards as evidence since one may hold distorted views about what counts as relevant evidence. Such views often exclude precisely that which needs to be considered if truth is to be pursued. Miseducation or sheer misunderstanding may lead someone to focus on dubious sources, ruling out from consideration a great deal of evidence that experts in the field consider relevant. Holocaust deniers see themselves as open-minded and willing to consider relevant evidence, but bias and prejudice lead them to trust tainted sources that prevent them from taking genuine evidence seriously. Proponents of creation science are not willing to attend to relevant geological evidence because they base their view on sources outside the sphere of science against which, in their mistaken view, scientific claims must be judged.

7. Since open-minded inquiry requires consideration of the best evidence available, the fact of epistemic dependence[2] inevitably means that we must turn to experts for a great deal of our knowledge, much of which we could never discover for ourselves and are in no position to critically assess and some of which we barely understand. In such cases, an attempt on our part to reach a conclusion independently of the experts, or even to weigh the evidence when the experts disagree, would not necessarily increase our prospects of gaining knowledge. Open-mindedness is compatible with credulism, which holds that it is justifiable to trust testimony in the absence of a reason to doubt, but it also requires that we avoid credulity and blind belief. This means that we need to monitor expert testimony as best as we as nonexperts can, either to establish the credibility of a particular expert or to determine the respective merits of rival experts. One important test of credibility is the extent to which the experts in question have themselves been open-minded in reaching their conclusions, and nonexperts are often able to make this judgment about experts.

8. Open-mindedness does not require that every possibility be seen as a serious threat to established views or as something that warrants careful examination. There is a difference between the possibility that a check has been deposited into my account (because a trusted friend told me a week ago he would do so in the next few days) and the possibility that there is a million dollars in my account (because someone might have decided to give me a pleasant surprise). The first possibility is very likely; the second, regrettably, is not likely in the least. It would be foolish to be open-minded about the latter possibility, perhaps checking to see if the money might be there, on the grounds that we cannot say for certain that it isn't. If we assume that every possibility is equally likely, inviting every fantastic scenario to open-minded investigation, serious inquiry is severely jeopardized and open-mindedness may slide toward credulity. This does not mean, however, that an open-minded person will never seriously consider a remote possibility. In life-or-death situations, no other possibility may exist.

9. Since it is disingenuous to claim to have an open-minded attitude toward others' views if we either prevent such views from being developed and circulated or support their suppression, open-mindedness evidently requires a presumption in favor of tolerance and the free expression of ideas in society. Open-mindedness recognizes the inevitability of pluralism with respect to beliefs and values, presupposes (subject to certain limitations, such as causing harm to others) that people must be permitted to explore and defend the ideas they favor, however unpopular, and emphasizes the need to decide what to believe (and what is worthy of further inquiry) based on the merits of the case. In this way, open-mindedness requires respect for open discussion and debate, involves genuinely listening to others (not just hearing them out), and holds out the prospect that progress on seemingly intractable issues can be made over time.

10. If open-mindedness is to flourish, a conception of education and an approach to teaching are required that highlight the value of this intellectual virtue. Essentially, this means that schooling must not only avoid indoctrination in every form but also help students to learn how to recognize and resist indoctrination and to develop their own independent judgment. This entails the nurturing of critical-thinking skills and the disposition to apply them. These aims of education and schooling need to be embedded in an approach to teaching that promotes discussion and inquiry in classrooms, encourages curiosity and wonder in students, welcomes questions from students that probe claims made by the teacher, and challenges students to support their own views with evidence and argument. Open-mindedness in teaching does not, however, preclude the teacher from taking a stand on contentious issues if this can be done in such a way that critical reflection is encouraged and authoritarian imposition avoided.

Open-mindedness, in brief, is not an invitation to give respectful and thoughtful consideration to pseudoscience, paranormal claims, Holocaust denial, and all manner of nonsense and flimflam; these ideas have failed the test of critical scrutiny, and rejecting them simply recognizes the outcome of open-minded inquiry. However unlikely, open-mindedness would require that the ideas be re-examined if new evidence emerged that supported such ideas.

A balanced treatment of evolutionary theory and intelligent design in science teaching would create the false impression that these theories are on an equal footing, which would constitute miseducation with respect to what counts as science. To regard all claims as embodying their own truth (relativism) amounts to giving up on the idea of truth altogether, making open-minded inquiry pointless. Open-mindedness does not rule out reaching firm conclusions; if we follow the argument, it may indeed lead to such an outcome. But the open-minded person remains ready to reconsider such conclusions in light of future evidence and argument that cannot now be foreseen. □

Notes

1. For an account of the value of open-mindedness, see my "Why Open-Mindedness Matters," *Think* 13, 2006: 7–15.

2. For further discussion, see Harvey Siegel, "Rationality and Epistemic Dependence," *Educational Philosophy and Theory* 20, 1, 1988: 1–6.

Deep History or Shallow Cognition?

Cognitive Biases and 'Esoteric History'

A host of new media productions, from self-published books to blockbuster movies, have reignited the belief that extraterrestrial visitors aided early human civilization. In 2009, cognitive science is well equipped to speak on this claim and the fundamental errors in human reasoning to which it appeals.

JOHN RAY

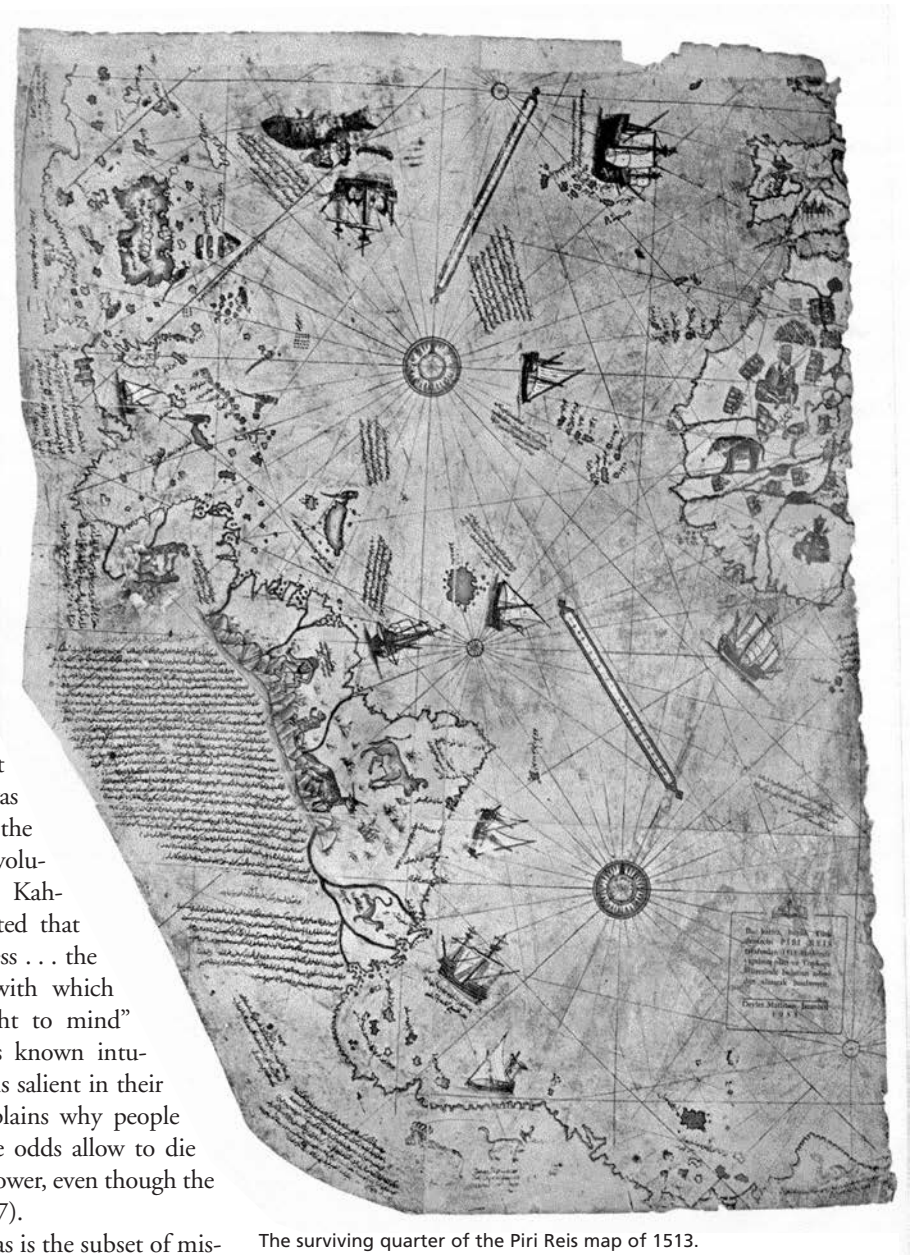
The Piri Reis map of 1513 appears to show a near-perfect mapping of the surface of the earth, including the landmass of Antarctica *under* the ice. Crystal skulls found throughout Latin and South America are carved with such precision that they seem to defy prosaic explanation. From 1000 AD in Latin America, we find a *model airplane*. What's going on?

Dozens of New Age authors already have answers. Gaining prominence in the "psychic forecasting" of Edgar Cayce (himself now a thoroughly exposed fraud) in the early-twentieth century and continuing today in a steady stream of often self-published books by "psychics" or "the attuned," their collective hodgepodge of hypotheses is known as

"Deep History" or "Esoterics."

These hypotheses propose that human civilization emerged only with the help of visiting aliens, who assisted early cultures in endeavors such as mining and building their architectural wonders, like the Egyptian pyramids and Stonehenge (von Däniken 1968). In a recent issue of *Sedona* magazine, Hannah Beaconsfield ("channeling" an "entity" called "The Pleidian Light") informs us that "the nature of computer science as it is developing on Earth is sourced from ET cultures. The basic binary technology has its roots in the Sirius world civilization," a reference to the popular "Deep History" theory that alleged aliens were from Sirius (Beaconsfield 2008). To confirm this theory, the subculture relies on such artifacts as those mentioned above, among many others.

Research into the limitations of human cognition seems to provide better answers. One product of this research that has been described exhaustively since it was first demonstrated empirically in 1974 is the availability bias. In one of their many revolutionary papers on the subject, Daniel Kahnemann and Amos Tversky demonstrated that "there are situations in which people assess . . . the probability of an event by the ease with which instances or occurrences can be brought to mind" (Kahnemann and Tversky 1974). As is known intuitively, people base their beliefs on what is salient in their memory. This phenomenon in part explains why people think they're much more likely than the odds allow to die from shark attacks than slipping in the shower, even though the latter is vastly more common (CDC 2007).



The surviving quarter of the Piri Reis map of 1513.

Another version of this availability bias is the subset of mistakes people make called the ineffective search set bias. "Is it more likely that [a] word starts with r or that r is the third letter?" Kahnemann and Tversky (1974) ask. They find,

> because it is much easier to search for words by their first letter than by their third letter, most people judge words that begin with a given consonant to be more numerous than words in which the same consonant appears in the third position . . . even for consonants, such as r or k, that are more frequent in the third position than in the first.

People have difficulty contextualizing information and prefer to use novel information as a frame of reference rather than to try searching out a more probabilistically sound frame in which it can be placed. The availability bias is present in the minds of everyone from young children to professional economists. Research shows that even formal education through the PhD level has only marginal effects on availability bias. This prevalent bias explains the continuing belief in Deep History theories.

The Piri Reis map of 1513 was an intricate, beautifully drawn chart, of which roughly one fourth survives today. Piri Reis, a Turkish admiral and cartographer for the Ottoman Empire, drew his map *portolan*-style, with rhumb lines (slanted meridian lines that spiral out from the poles) with special attention paid to coastal features over inland features. If the bottom section of the surviving quarter is rotated a few dozen degrees, it appears to generate a remarkable reproduction of the landmass of Antarctica under the ice layer. In Esoterics, this is a sign that Reis had found even older maps from some source civilization that was able to chart parts of

John Ray is a decision science major at Carnegie-Mellon University. He may be reached at jrray@andrew.cmu.edu.

the planet that wouldn't otherwise be fully explored until the twentieth century. In most Esoterics works this supposed source civilization is called—you guessed it—Atlantis.

"The Piri Reis map is a typical portolan-style map of the late fifteenth and early sixteenth centuries," historian Gregory McIntosh argues on the subject. "This indicates that Piri Reis undoubtedly used European portolan charts and portolan-style maps in composing his world map" (McIntosh 2000). McIntosh's book, *The Piri Reis Map of 1513*, which explains the rich history of the map, has never been fully addressed by Esoteric historians. This doesn't necessarily mean they're unfamiliar with it, however.

In explaining the actual history of the Piri Reis map—it turns out it was based on several of Christopher Columbus's maps and makes several serious geographical errors—

The Phaistos Disk

McIntosh even concludes:

> The Piri Reis map is not the most accurate map of the sixteenth century, as has been claimed, there being many, many world maps produced in the remaining eighty-seven years of that century that far surpass it in accuracy. The Ribero maps of the 1520s and 1530s, the Ortelius map of 1570, and the Wright-Molyneux map of 1599 ("the best map of the sixteenth century") are only a few better-known examples. (McIntosh 2000, 59)

Another artifact similarly shrouded in artificial mystery is a small, golden trinket from any of several proposed tribal Mesoamerican cultures dating, as one Esoterics Web site proposed, from anywhere between 500 and 1000 AD (Janku 1996). The object readily presents itself as a little model airplane, complete with properly placed wings and dorsal fin, even, perhaps, a little pilot's seat and cockpit.

How is the casual observer supposed to know any different? What in the life experience of the average person suggests that a small object with wings, dorsal fins, a seat, and a cockpit is anything *other* than a toy airplane? Is there a Classical Latin American History PhD in the house?

Of course not. Internet sites and self-published literature are not generally considered within the realm of serious historical inquiry. But as the research of Kahnemann, Tversky, and many others points out, that isn't really how cognitive processes embed information, and it definitely isn't how we embed information as being either *correct* or *incorrect*.

Eminent naturalist and skeptical investigator Baruch de Spinoza, in *Ethics*, described his theory of how mental systems process belief and came up with an internal agent that can be described as a "lazy librarian." Daniel Gilbert summarizes:

> He dismissed [René] Descartes's distinction between comprehension and assessment and insisted instead that comprehending and accepting were, in fact, the same operation. Spinoza argued that to comprehend a proposition, a person had to implicitly accept that proposition; only later, if the person realized that this proposition conflicted with some other, might he or she change his or her mind. As William James (1890) would later characterize Spinoza's position, "All propositions, whether attributive or existential, are believed through the very fact of being conceived. . . ." (Gilbert 1991)

Spinoza's account wasn't entirely accurate but came far closer than the previous Cartesian model, which proposed that mental systems rationally scrutinize and qualify every new piece of information as either truth or fiction as it arrives (how Descartes, who spent much of his life trying to explain and teach calculus to curious pupils, could've thought that rational acceptance and understanding of new propositions was a guaranteed process is baffling.) It is analogous to a librarian who receives a large number of new books every week, far too many to read in the seven days before the next load. In fact, he has just enough time to barely glance through the first few pages of each book before he has to put it on the shelf and move on. It's only much later, if those first few pages gave the librarian sufficient pause, and if the librarian has sufficient spare time, that he'll go back and label that book as "fiction" (Gilbert 1991).

This is close to how the brain processes information in the real world. Though humans get somewhat better at it as they get older (but not necessarily as they become more educated), there is only so much information that can be scrutinized before a cognitive load maximum is reached. In the lead-up to that load, our skeptical faculties get progressively sloppier. That's why the brain unconsciously relies on second-rate rules of thumb like the availability heuristic. For this same reason, people who have been exposed to a sufficiently lopsided load of esoteric-oriented information may simply ignore contrary information. This is why McIntosh's book may not have answered the question of the Piri Reis map as he hoped it would (McIntosh 1)—the information he presented may have caused cognitive dissonance in the minds of its targets, who subsequently rejected it.

The Phaistos Disk is a flat, record-shaped slab of stone dis-

covered in Crete in 1903. On its front face are dozens of unidentified hieroglyphs in a spiral. The object supposedly dates as far back as 1700 BC ("Phaistos" 2002). Nothing has been conclusively discovered about the language in which the hieroglyphs are carved, and almost nothing is known about the various local cultures that may have produced it.

With what is known about mental processing, what does the brain most likely do when confronted with this information? Well, if yours were not currently primed to think otherwise by the fact that this article appears in SKEPTICAL INQUIRER, it would almost certainly fall back on the rules of thumb discussed thus far. If any cognitive dissonance was generated by this proposition, it would be prompted by your prior knowledge of ancient Cretan cultures, their trading partners, their languages, and their ability or lack thereof to work with abstract concepts and stone tools. Odds are that such dissonance has arisen. And because it requires significant, deliberate attention to scrutinize and determine that new data is false, unless you were hearing this information from a source you knew to be disreputable, you would have no reason to question it.

In fact, by now you would probably be thinking, "Hey, this mystery is kind of like that little Mayan model airplane or those wild crystal skulls. Hmmm, that makes me wonder how all those giant pyramids even got there in the first place. . . ."

Armed with this smattering of pseudohistorical analyses of objects from hazy and mysterious parts of humanity's past, one has suddenly fallen for another mental bias known as *representativeness*. Representativeness bias occurs when you ignore aggregate probabilities when they might contradict your initial impression of a category. What is fundamentally more likely: over the centuries certain cultures produce thousands of small, trivial trinkets—enough so that sheer odds dictate that *some* of them would end up resembling *some* form of twenty-first-century technology—or that each of these same artifacts is its own complete category of "clues left behind by the aliens?" Had you spent years learning about ancient history from wide-ranging, comprehensive sources, there would be no question. But had you simply sat down and had this list of trinkets rattled off to you, such a question would never even enter your mind. It's almost certain that the category of object "clues left behind by the aliens" does not, in fact, exist. However, by being presented with biased information, the brain of a believer in "Esoteric history" will radically skew that probability.

How many people have the time or inclination to seek out a decade-old academic book that explains the Piri Reis map in only the most technical and erudite of terms? How many semesters would have to be spent studying Mesoamerican history before an artifact like the "model plane" would actually make sense in a cultural context? The processes by which these objects become a vaguely connected hypothesis about technologically advanced civilizations assisted by visitors from beyond are part of the same mechanical foibles that have plagued consciousness in such manifested forms as racism and irrational self-confirmation probably since the existence of higher-order cognition.

How is the casual observer supposed to know any different? What in the life experience of the average person suggests that a small object with wings, dorsal fins, a seat, and a cockpit is anything other than a toy airplane? Is there a Classical Latin American History PhD in the house?

"Deep history" ideas play upon biases that force us to rely on shoddy information and to seek out material to confirm the mental categories we have created with our limited snippets of history. Unfortunately, all too often, the call to try to contextualize such information in more subtle (and more accurate) historical milieus seems simply unconvincing compared to grand theories about alien origins of human civilization. In a world where crystal skulls seem to be more plausibly of extraterrestrial origin to some people rather than the independent flukes of probability inevitably arising out of a world of thousands of civilizations leaving behind millions of independent trinkets, it seems all one can do as a skeptic is try. □

References

Beaconsfield, H. 2008. The past and future of computer technology. *Sedona: Journal of Emergence* 18 (5): 66–67.

Centers for Disease Control and Prevention (CDC). 2007. Deaths: Leading causes for 2004. National vital statistics reports 56(5).

Von Daniken, E. 1968. *Chariots of the Gods?* New York: G.P. Putnam's Sons.

Gilbert, D. 1991. How mental systems believe. *American Psychologist* 46 (2): 107–119.

Janku, L. 1996. Precolombian aircraft models. World Mysteries. Available online at www.world-mysteries.com/sar_7.htm.

Kahnemann, D., and A. Tversky. 1974. Judgment under uncertainty: Heuristics and biases. *Science* 185 (4517):1124–1131.

McIntosh, G. 2000. *The Piri Reis Map of 1513*. Georgia: University of Georgia Press.

World Mysteries. 2002. The Phaistos Disk. Available online at www.world-mysteries.com/sar_9.htm.

The Potential Habitable Zone on Saturn's Moon Enceladus

Recent discoveries from NASA's Cassini spacecraft have led many scientists to believe that numerous microorganisms found on Earth could potentially survive on Saturn's moon Enceladus.

FELIX WASIAK

NASA's Cassini spacecraft continues its close flybys of Saturn's moon Enceladus, sampling the enormous plumes of water vapor and icy particles being ejected hundreds of miles into space. The most recent flyby was in October 2008; the next is planned for November 2009. The prospect of near-surface liquid water on another planetary body has never been so promising. Of course water in and of itself is not what makes this discovery so exciting: it's the underlying potential of a habitat conducive to supporting life. Not since the Mars Viking missions of the 1970s has the talk of possible life on another planet buzzed so prolifically. But is this buzz justified? Healthy skepticism abounds as the search goes forward.

"Enceladus represents one of the likely, if there is such a thing, places in our solar system other than the Earth where we might find biological activity," said Andrew J. Dombard, visiting associate research professor, department of Earth and Environmental Sciences, University of Illinois at Chicago.

"Personally, I don't think there is life anywhere in this solar system apart from the Earth, but I do think it's very likely there is life in other solar systems," said Francis Nimmo, associate professor, department of Earth and Planetary Sciences, University of California, Santa Cruz.

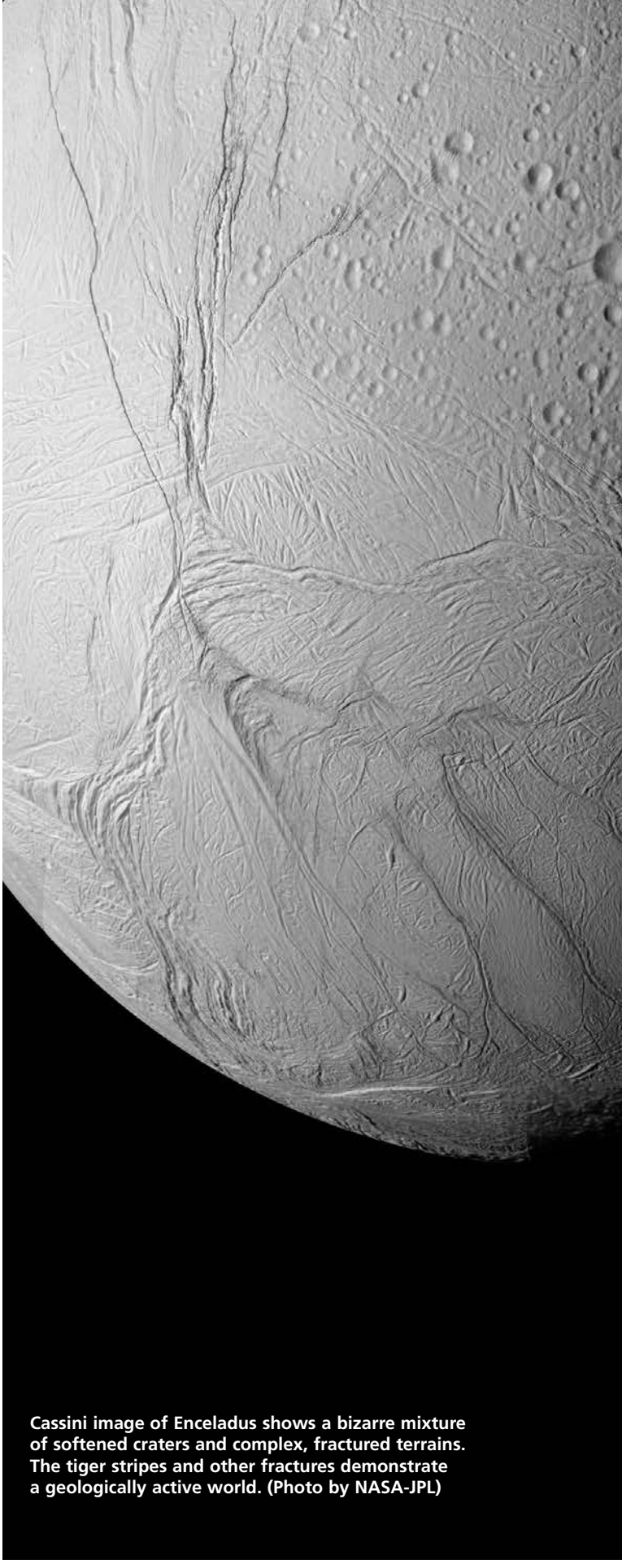
Dombard and Nimmo both served on the Science Definition Team for NASA's Enceladus Flagship Mission Concept Study (NASA Goddardd Space Flight Center 2007).

Many scientists now believe an "Earth-like" planet is not necessary for potential life elsewhere. The so-called "habitable-zone," the distance a planet would have to be from the Sun to ensure life wouldn't get too hot or too cold and the Sun's energy would provide the energy for life through photosynthesis, is being extended. Once thought to only lie somewhere between Earth's closest neighboring planets Venus and Mars, several potential micro-habitable zones have now been identified in our solar system. Many scientists now believe that numerous microorganisms found on Earth would do just fine on several of the moons orbiting Jupiter and Saturn. It is not only discoveries in space that have fueled this paradigm shift—in the 1970s scientists discovered life deep in our oceans, where sunlight is unable to reach, that is not dependent on energy derived from our sun. Instead, it depends on hot, nutrient-rich water emanating from hydrothermal vents. Rather than utilizing photosynthesis, these organisms rely on chemosynthesis to survive.

How life on Earth originated is not known; however, the general theory is that billions of years ago the Earth had the ingredients, the environment, and most important, the time for life to form. The time—the primary limiting factor in laboratory experiments—spanned hundreds of millions of years, during which complex chemistry occurred until finally, in just the right way and under the right environmental conditions, the chemistry came together and *voila*: life. A very basic system of organic molecules was created within a rudimentary membrane, capable of following a template to replicate and catalyzing other reactions necessary for maintenance (Lunine 2005). Early life would most probably have obtained energy through chemosynthesis, with the more complex photosynthesis evolving later.

A vivid imagination is not necessary when contemplating what sort of life is possible on Enceladus—one need only look at the earthly examples known as "extremophiles." These are bacteria capable of living in extreme environmental conditions of temperature, pH, radiation, pressure, salinity, dryness,

Felix Wasiak is a doctoral student in space and planetary sciences at the University of Arkansas. He is currently on sabbatical from Northrop Grumman Space Technology, following a twenty-five-year career as an aerospace engineer, to pursue his interests in planetary sciences. He is a member of the Fayetteville Freethinkers in Fayetteville, Arkansas. E-mail: fwasiak@uark.edu.



Cassini image of Enceladus shows a bizarre mixture of softened craters and complex, fractured terrains. The tiger stripes and other fractures demonstrate a geologically active world. (Photo by NASA-JPL)

absence of oxygen, absence of sunlight, and chemicals. Earth is teeming with life, from deep within its crust to high in the atmosphere, and the variety of that life is greater than we could ever imagine. Indeed, to many extremophile microorganisms on Earth Enceladus might be like a balmy vacation resort where life is easy and a party is never far away.

Were the conditions on Enceladus right for life to arise at some point? Perhaps it doesn't matter. The earliest evidence of life on Earth is found in biogenic matter in sedimentary rocks dating 3.85 billion years ago (Lunine 2005). Since that time, the Earth has been subjected to countless meteor impacts, the largest of which are capable of thrusting material from Earth into space. While much of this debris falls back, some can escape Earth's gravitation. Certain bacteria and spores buried within this rock could lie dormant for eons in space, with the rock acting as a shield against solar radiation and cosmic rays. Should this rock subsequently strike a planetary body such as Enceladus, it could "seed" this new world. Is life generated from seeding more probable than life forming spontaneously, and what is the probability of neither occurring? Rocks from Earth certainly have been thrust into space, and these rocks certainly have had bacteria within them. Whether any of these rocks then made it to the distant reaches of the solar system and subsequently seeded new worlds is one of the big questions NASA would like to answer.

Other planetary bodies, such as Jupiter's moon Europa, are thought to have subsurface liquid water, so why all the fuss about Enceladus? Remotely drilling through hundreds (or thousands) of meters of ice on a distant planet is all but an impossible task, if not technically than certainly financially. The plumes on Enceladus offer the ability to sample water through conventional means without complicated drilling scenarios (NASA Goddard Space Flight Center 2007).

Enceladus is geologically active, and one of only three outer solar system bodies where volcanic eruptions have been observed; the other two are Jupiter's moon Io and Neptune's moon Triton. The eruptions occur from fissures commonly known as the "tiger stripes" in the south polar terrain. Enceladus is a relatively small moon with a diameter of 512 × 494 × 489 kilometers (318 × 307 × 304 miles). Due to its distance from the Sun it receives very little solar energy, and has an estimated mean surface temperature of –198° Celsius (–324° Fahrenheit). Heat acquired during Enceladus's initial formation 4.6 billion years ago would have cooled off long ago on a body this small. So where does the energy to power this geological activity come from? Many models developed by planetary scientists explain the current state of affairs. They include tidal heating from Saturn's intense gravity and radioactive decay in Enceladus's silicate core.

NASA

The Cassini spacecraft swings in orbit around Saturn.

Tidal heating is a phenomenon similar to the ocean tides on Earth, which are caused by the Moon's (and to a lesser extent, the Sun's) gravitational pull on the Earth's oceans. Enceladus experiences a much greater gravitational force from the great mass of Saturn than Earth does from its Moon, and this force bulges, cracks, and shifts Enceladus's surface as it orbits Saturn. The resulting frictional forces create heat.

"If you have a crack and you're shearing it back and forth on itself you can dissipate heat, I mean the same way that you can warm your hands by rubbing them together. It's the same principle," Dombard said.

Accounting for the approximately six gigawatts of power emanating from the southern polar region has been a chal-

lenge. One model suggests the heat required to power the plumes is based on shear heating by tidally driven lateral "strike-slip" fault motion. The energy generated by shearing would cause heating and thus induce sublimation—transition from solid to gas without the intermediate liquid stage—which occurs at relatively low temperatures on Enceladus due to a lack of atmospheric pressure. The vapor produced by this heating escapes through cracks opened by tidal stresses, resulting in the observed plumes. The tidal displacements required suggest a subsurface ocean, either global or possibly localized, decoupling the thick ice shell from the silicate interior, thus allowing sufficient flexing to generate the energy seen in Cassini observations (Nimmo et al. 2007). Of course, models can only go so far with so much data; a future mission could help resolve many ambiguities.

"For the orbiter it would be very nice to have a radar, because a radar is the best way of seeing through the ice shell, potentially to the ocean below," Nimmo said. "Also it's good at detecting pockets of water, even if there is not a continuous layer of water, so that would help tell us what the mechanism is that's actually causing the tiger stripes and the vapor plumes. For a ground-based instrument it would be very interesting to have a seismometer, because that might tell you something about how deep the fractures are, and whether they're really active and generating strike-slip motion, because that's what we think."

"I would love to get a lander down on the surface to do *in situ* chemical analysis and geophysical techniques—seismology to try to pin down the nature of the ice shell," Dombard said.

Another model suggests that short-lived radiogenic isotopes, especially aluminum 26 and iron 60, were present at the time of formation, and this initial heat "pulse" led to melting in the silicate core, resulting in volcanism. Tidal heating has maintained partially molten regions over the long term. (Castillo-Rogez et al. 2007).

The instruments onboard the Cassini spacecraft have taken plume composition measurements. The plume is 91 percent water, about 4 percent nitrogen, 3.2 percent carbon dioxide, and 1.6 percent methane (NASA-JPL News Release 2008). Trace amounts of organic material besides methane also have been detected. While non-biological processes produce numerous organic compounds that are found throughout the solar system, their detection is always encouraging when considering the potential for life, as all life on Earth is based on carbon.

So what should a future flagship mission to Enceladus entail? According to NASA's *Enceladus Flagship Mission Concept Study* (NASA Goddard Space Flight Center 2007), the greatest scientific payoff would come from an Enceladus orbiter and lander. How much priority should be given to instrumentation for the detection of life?

"Assessing the biological potential was our number one priority for the Enceladus Flagship (Mission Concept Study)," Dombard said. "That's why we want to fly through the plumes, that's why we want to get down to the surface and do *in situ* chemical analysis looking for amino acids and other chemical compounds."

"The people who are interested in astrobiology would really like to get hold of a sample of the plume material because that's likely coming from inside the satellite, and so it gives you your best chance of sampling the satellite interior, so being able to measure the composition of the material that's coming off the tiger stripes I think is very important, whether or not you actually want to be inside a tiger stripe, I think that's less obvious, but getting a sample of the plume material is obviously very important," Nimmo said.

A vivid imagination is not necessary when contemplating what sort of life is possible on Enceladus—one need only look at the earthly examples known as "extremophiles."

No one knows if life does actually exist beyond Earth. We do know there are life forms on Earth capable of surviving in varied and harsh conditions, and there are environments on planetary bodies such as Enceladus that appear capable of supporting such life. Many scientists remain open to the possibility and are doing their best to answer the question—they continue to do science. □

References

Castillo-Rogez, J. C., D. L. Matson, S. D. Vance, A. G. Davies, and Torrence V. Johnson. 2007. The early history of Enceladus; setting the scene for today's activity. Lunar and Planetary Science; XXXVIII; *Papers Submitted to the Lunar and Planetary Science Conference* 38, Abstract 2265.

Domard, A. 2008. Telephone interview by Felix Wasiak.

Lunine, Jonathan Irving. 2005. *Astrobiology: A Multidisciplinary Approach*. San Franciso: Pearson Addison Wesley.

NASA-JPL News Release. 2008. Cassini tastes organic material at Saturn's geyser moon. March 28. Available online at www.jpl.nasa.gov/news/news.cfm?release=2008-050.

NASA Goddard Space Flight Center. 2007. Enceladus flagship mission concept study. August 29. Available online at www.lpi.usra.edu/opag/Enceladus_Public_Report.pdf.

Nimmo, F. 2008. Telephone Interview by Felix Wasiak.

Nimmo, F., J. R. Spencer, R. T. Pappalardo, and M. E. Mullen. 2007. Shear heating as the origin of the plumes and heat flux on Enceladus. *Nature* 447(7142), 289–91.

Spencer, John, and David Grinspoon. 2007. Planetary science: Inside Enceladus. *Nature* 445(7126), 376–7.

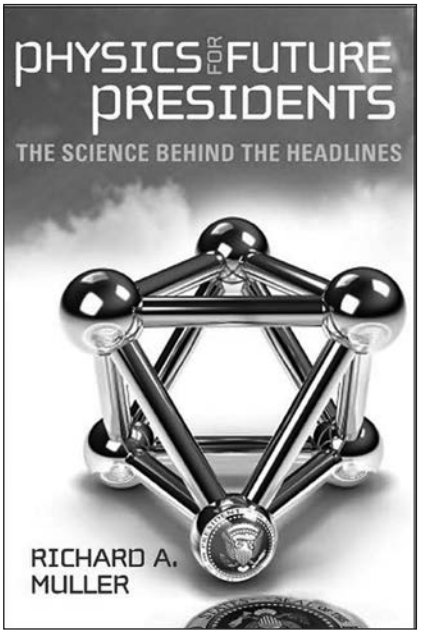
Questioning Conventional Wisdom on Science-Related Issues

KENNETH W. KRAUSE

Physics for Future Presidents: The Science Behind the Headlines. By Richard A. Muller. W.W. Norton and Co., New York, 2008. ISBN: 978-0-393-06627-2. 380 pp. Hardcover, $26.95.

Does our new president appreciate the basic science behind terrorism, energy, nuclear weapons, space exploration, and global warming? He probably knows a lot more than the vast majority of his constituents, quite honestly, which is really why physics professor Richard Muller wrote this persistently engaging and occasionally surprising little book. A potent distillation of his science-and-society course for nonscience majors at the University of California, Berkeley, Muller casts a refreshingly skeptical glance on several of the twenty-first century's most sacred scientific cows.

Because Americans use about 28 percent of their fuel for transportation, electric- and hydrogen-powered vehicles are often either touted as inevitable waves of the near future or bemoaned as the victims of greedy oil companies. But neither optimism nor opulence can prevail over the physical facts. The news is "full of hyperbole" about electric cars, Muller warns, especially with regard to the new Tesla Roadster and plug-in



hybrids. He might be right. In the September 20, 2008, *New Scientist*, for example, Jim Giles judged that "electric cars are coming of age."

Pound for pound, however, even the best batteries can store just one percent of the energy contained in gasoline, as Muller points out, and all batteries need to be replaced after a limited number of charges. (According to Giles, lithium-ion cells—found in the Roadster, for example, can withstand only 5,000 recharge cycles, while nickel-metal hydride batteries—common to the Toyota Prius—can take about 3,000). Recently marketed, most Priuses will be fine for a while, and driving them will seem relatively cheap. But owners should bank their pennies for the second battery. "Who killed the electric car?" Muller chides, "Expensive batteries did."

Hydrogen, on the other hand, holds 2.6 times more energy per pound than gasoline. Maybe that's why some enthusiasts say that a "hydrogen revolution" is only ten years away. Unfortunately, because it's so light, a pound of hydrogen fills a lot of space. We can compress it, but then we have to store it in a heavy container. We can liquefy it too, but even fluid hydrogen is relatively buoyant. Solid hydrogen technology is not an option because it has yet to emerge from the laboratory. Compressed hydrogen will give us only five miles per gallon, says Muller, and its liquid form no more than ten. So, in reality, hydrogen actually provides three times less energy than gasoline.

But, because hydrogen is less an energy source than a means of storing energy, the usable fuel must be manufactured—either through electrolysis, which breaks up water into its elemental components, or through "steam reforming," which creates hydrogen by reacting natural gas (methane) with steam. Either way, a great deal of energy is burned in the process. And what about infrastructure? To date, there are only twenty-six refueling stations in California and 150 worldwide. Muller concedes that hydrogen has some potential uses, such as in ultralight airplanes or in large vehicles like buses that can support capacious fuel tanks and stop for fre-

Kenneth W. Krause is contributing science editor for the Humanist and books editor for Secular Nation. He is a frequent contributor to Skeptical Inquirer *and has contributed to* Free Inquiry, Skeptic, Truth Seeker, Freethought Today, Wisconsin Lawyer, *and* Wisconsin Political Scientist. *Krause may be contacted at krausekc@msn.com.*

quent refills. But the physics of hydrogen, he insists, ensure that the would-be "revolution" will remain ten years away for a very long time.

And speaking of extended lags, Muller and approximately 77,000 tons of American nuclear waste have waited far too long for the government to open up Yucca Mountain, Nevada. Fission fragments such as strontium-90 are among the most dangerous forms of nuclear litter. Because of their short half-lives, these fragments are much more problematic than plutonium (which Muller contends should be reprocessed in the United States) and about 1,000 times more radioactive than the original uranium ore. So it will take about 10,000 years for the waste to decay back to the level of the originally mined uranium.

Even so, Muller disagrees with those who argue for 10,000 years of absolute safety. The public discussion, he says, should take into account the physical and mathematical facts of radioactive decay. Because the waste's radioactivity is only 1,000 times worse than that of the original uranium, our goal should be to reduce the risk of leakage to 0.1 percent (one chance in a thousand), which is equivalent to the risk of simply leaving the uranium in the ground. But after 300 years, the fragments' radioactivity will be only 100 times that of the uranium, so we could accede to a 1 percent chance of total leakage, Muller calculates, or a 100 percent chance of 1 percent leakage.

The Department of Energy, however, is concerned about earthquakes as well, and many contend that the discovery of a new fault under Yucca Mountain should completely disqualify the site. But, again, the relevant standard is not absolute security. The question is not whether any earthquake will occur during the next 10,000 years but whether there exists a 1 percent chance of a sufficiently dangerous earthquake (causing 100 percent leakage into the groundwater) after 300 years. Alternatively, Muller argues, we should accept a 100 percent risk that 1 percent (or a 10 percent risk that 10 percent) of the waste will escape.

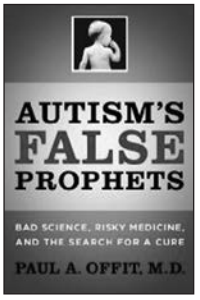
If Yucca Mountain was at full capacity and all of its waste were to leak out of its glass pellets and seep into the groundwater, the resulting problem would still be twenty times less severe than that posed by the natural uranium currently floating around in the Colorado River, which—not so incidentally—provides potable water to much of western America, including Los Angeles and San Diego. "Waste leakage from Yucca Mountain is not a great danger," Muller judges. Instead, we should worry more about "real threats—such as . . . the continued burning of fossil fuels."

Quite regrettably, "much of what the public 'knows' about global warming," the author contends, "is based on distortion, exaggeration, or cherry picking." After scientists discovered in 2006 that Antarctica was losing thirty-six cubic miles of ice per year, for instance, the media widely and hastily reported the damage as compelling new evidence of global warming. But, as the experts noted, because warming increases oceanic evaporation and because the extra water vapor falls as snow when it reaches Antarctica, global warming would actually increase the Antarctic ice mass.

Muller by no means denies warming or its recent anthropogenic causes, but he does assail *An Inconvenient Truth*, Al Gore's popular film, with conspicuous vigor. Gore employed a version of Michael Mann's famous "hockey stick" plot in a dramatic and memorable attempt to show that world temperatures are currently higher than they have been in at least 1,000 years. But the National Research Council of the National Academy of Sciences subsequently declared the plot to be seriously flawed, concluding that, at best, temperatures are now higher than they have been in about 400 years—which was already common knowledge. Former vice president Gore, Muller scolds, won the Nobel Prize "through a combination of artistry, powerful writing, and exaggeration, mixed with some degree of distortion and a large amount of cherry picking."

Muller by no means denies warming or its recent anthropogenic causes, but he does assail *An Inconvenient Truth*, Al Gore's popular film, with conspicuous vigor.

Physics for Future Presidents is anything but comprehensive, of course. Nevertheless, Muller offers casual readers an approachable and truly delightful cornucopia of general science education. Perhaps best of all, however, the text forces us to question conventional wisdom and to wonder about all of the intriguing facts and arguments that we, as responsible Americans and citizens of the world, have been ignoring for far too long.



Bearing False Witness for Profit

GREG MARTINEZ

Autism's False Prophets: Bad Science, Risky Medicine, and the Search for a Cure. By Paul A. Offit, MD. Columbia University Press, New York, 2008. ISBN 978-0-231-14636-4. 298 pp. Hardcover, $24.95.

To say that people love a good story is cliché, but the primary problem with that statement is that *love* is too mild a term. People *need* their stories with a depth of feeling that belies rationality. Stories can provide comfort, structure, and even provide an individual with an identity. An idea can be boundlessly outlandish, but if couched in a compelling narrative, it can gain acceptance in ways and by numbers that defy belief. Examples of this abound from the big picture of religion to smaller notions like conspiracy theories.

One recent narrative is that vaccines cause autism in children (see the three-article special section "Vaccines and Autism: Myths and Misconceptions," SI, November/December 2007). There are few narratives as dramatic, as *inflaming*, as that of a child being threatened, and that is the core conflict examined by Paul Offit, MD, in his masterful *Autism's False Prophets: Bad Science, Risky Medicine, and the Search for a Cure*. In the course of his own carefully written narrative, Offit, the chief of Infectious Diseases and director of the Vaccine Education Center at Children's Hospital of Philadelphia, tells many stories that come together to provide a deeply disturbing depiction of how quack science based on falsified research quickly fueled a monstrous conspiracy theory accusing vaccine manufacturers and the physicians administering them of willfully harming children in a malicious conspiracy for profit.

Offit's approach to this poisonous idea is to tell his tale from the beginning. He dates the earliest discussion of autism (as a diagnosis) to a paper published in 1943 and tells of the distressing rapidity with which bad information began to crowd out good research. Bruno Bettelheim and his harmful and incorrect ideas about autism and parenting provide an early model for the accusatory and factually deficient approaches taken up by many others, but the grandfather of this conspiracy theory lies in the "research" published in the *Lancet* in 1998 by Andrew Wakefield, a gastroenterologist working at London's Royal Free Hospital.

Offit weaves the story of Wakefield's rise and fall through the book, vividly illustrating how his medical fraud and quackery metastasized through the autism community. It became the basis for the accusation that the medical community not only did not know what to do about autism but was actually intentionally causing it through an amoral and greedy pursuit of profits by administering immunizations that they knew caused the disease.

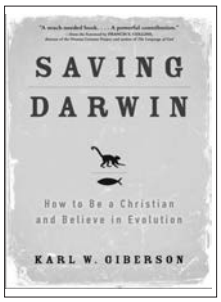
Offit carefully and clearly explains the shaky basis of Wakefield's theory: that the MMR vaccine causes inflammation to intestines, allowing harmful proteins (though he could not identify what those were) to pass through the damaged intestine and harm a rapidly developing brain. That such a finding was published in one of the oldest and most respected medical journals in Great Britain, the *Lancet*, caused an explosion of press coverage whose shock waves carried over the globe. Wakefield's hypothesis was not generally supported by his paper, but the sheen of legitimacy granted to it by its publication was thrown into the maelstrom of a sensation-seeking and conflict-hungry global media machine that roared to a white-hot pitch in a matter of days.

The need for a narrative took over at this point. That the scientific method (which takes time) and the court proceedings that arose in the aftermath (which take even longer) utterly disproved the legitimacy of this theory was lost on a media interested in dramatic conflict and the pronouncements of celebrities, no matter how incorrect and ignorant they may be, over clarity. The compelling, emotionally gratifying narrative of an evil entity defied by newly empowered victims sells better than the slow, reflective work of science.

Tragically, this story does not begin and end with Wakefield. Despite a lack of corroborative research and court proceedings that revealed the depth to which Wakefield falsified his dubious research, the idea of vaccines causing autism has mutated and survived. If it wasn't MMR, then it was the mercury in the thimerisol used to preserve multi-dose vials of vaccines. Wakefield opened a Pandora's box of bad science that shows no signs of abating. "Cures" have abounded, and some have caused greater harm and even death to the children treated. This is a narrative that still lacks a happy ending.

Science still hasn't determined the cause of autism, which is frustrating a community of people who are desperate for a cure for their children's medical condition. What this narrative provides to parents of autistic children (and anyone else interested in their fate) is someone to *blame*, a nemesis they can safely direct their anger toward. Autism has been a mystery since it was initially identified over half a century ago, and progress on research has only recently begun to illuminate its genetic basis. In the absence of a clear cause, it is more emotionally satisfying to identify already existing villains (Big Pharma and Big Medicine) as the cause of it all. Offit himself has been the victim of this abuse but has bravely produced a definitive account of this tragic story.

Greg Martinez lives in Gainesville, Florida. E-mail: martineg66@yahoo.com.



A Christian Physicist's Dispatch from the Evolution Wars

GLENN BRANCH

Saving Darwin: How to Be a Christian and Believe in Evolution. By Karl W. Giberson. HarperOne, 2008. ISBN 978-06-122878-0. 248 pp. Paperback, $24.95.

Saving Darwin is the latest dispatch from the evolution wars, offering, in the words of its author, "a tour of this troubled battlefield." Karl Giberson, a professor of physics at Eastern Nazarene University, is a veteran cicerone, having presented a useful introduction to the controversy in a previous book, *Species of Origin: America's Search for a Creation Story*, coauthored with the historian Donald A. Yerxa. In *Saving Darwin*, Giberson escorts the reader past a number of familiar landmarks: the development of Darwin's theory of evolution against the background of Paley's natural theology, the emergence of fundamentalism as a reaction to the higher criticism, and the contentious legal history of teaching evolution from the Scopes trial in 1925 to the *Kitzmiller* trial in 2005. A detour introduces Darwin's "dark companions"—the disreputable movements, such as eugenics, with which evolution is often associated, especially by its detractors. Making their appearance in serried ranks throughout the book are the partisans of creation science and intelligent design, the polemicists of atheism who invoke the success of evolutionary biology in the course of arguing against faith and the Christians who have made their peace with evolution.

Glenn Branch is the deputy director of the National Center for Science Education, a nonprofit organization that works to defend the teaching of evolution in the public schools. He is the coeditor, with Eugenie C. Scott, of Not in Our Classrooms: Why Intelligent Design is Wrong for Our Schools *(Beacon Press, 2006).*

Toward the end of the tour, Giberson discloses his own allegiance: "I think evolution is true. The process, as I reflect on it, is an expression of God's creativity, although in a way that is not captured by the scientific view of the world." He was not always of that opinion. As a college student, he recounts, he was a hardcore fundamentalist armed with a copy of *The Genesis Flood*, the foundation of creation science, and eager to join the creationist cause as soon as he obtained his doctorate. His study of science, however, convinced him that evolution was scientifically robust, and his exposure to biblical and theological scholarship persuaded him that accepting evolution was not, after all, a problem for the essential tenets of Christianity. Although Giberson offers a few tentative suggestions (describing them as "above my pay grade") toward a reconciliation of evolution and Christianity, the book's subtitle, *How to be a Christian and Believe in Evolution*, is misleading. His main concern in *Saving Darwin* is not with how but why: he is not providing the theological details of such a project but arguing for its desirability.

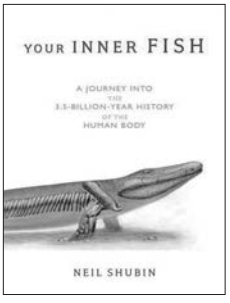
Such a reconciliation may be desirable, but is it possible? Both creationists and at least a handful of atheist polemicists—if not as many as Giberson seems to think—agree that it is not. Thus central to *Saving Darwin* is a rejection of the idea that there is a forced choice between Christianity and evolution. "Almost everyone who talks about evolution insists that we must make a choice between evolution or creation, materialism or god, naturalism or supernaturalism," Giberson declares. "But this dichotomy is *wrong*. These are not the only two options. These are not even the most reasonable options" (emphasis in original). Opposing the dichotomy, and thereby making space for reconciling science and faith, is the main concern of *Saving Darwin*. It is a praiseworthy concern, especially in a country where almost a third of science teachers report experiencing pressure to teach creationism in their classrooms. Even those who are not especially interested in whether Christianity is able to accommodate evolution ought to respect sincere and honest efforts at reconciliation, if only in the hope that they will help to reduce the pressure on the beleaguered teachers, giving their students a better chance to attain a proper understanding of evolution.

But Giberson's concern sometimes leads him to overstate the case. Is it really a fact that "almost everyone who talks about evolution" insists on the dichotomy? Then what of Howard van Till, Darrel Falk, Francis Collins (who contributed the foreword to the book), Kenneth R. Miller, John Haught, Alister McGrath, Keith Ward, and Michael Ruse, all of whom Giberson approvingly mentions as affirming the compatibility of Christianity and evolution? Similarly, Giberson complains that "the content and significance of evolutionary theory is communicated to broad audiences by people like [Richard] Dawkins" in trade books like *The Blind Watchmaker*, which famously includes a hefty dollop of triumphal atheism along with evolution. But what about Carl Zimmer, Sean Carroll, and David Sloan Wilson, for example, who expound evolution in popular trade books without lashing out at faith? And surely the primary messengers of evolution for the broadest audience are biology textbooks, which are generally silent on or neutral about the implications of evolution for religion. Unmentioned, too, are the efforts of the scientific establishment to debunk the dichotomy that Giberson deplores, such as *The Evolution Dialogues* (published by the American Association for the Advancement of Science in 2006) and *Science, Evolution, and Creationism* (published by the

National Academy of Sciences in 2008).

Perhaps in the spirit of Mercutio's "A plague o' both your houses," Giberson sometimes draws a misleading equivalence between creationists and their opponents. His discussion of a fracas over a definition of evolution offered by the National Association of Biology Teachers in 1995, for example, is captious and uncharitable, perhaps because it relies on a tendentious account by Phillip Johnson, the godfather of intelligent design. Similarly, his discussion of a failed attempt to include antievolution rhetoric in the No Child Left Behind Act of 2001 criticizes the scientific community for its strenuous opposition to the so-called Santorum amendment, while not acknowledging that, even despite the amendment's failure, it was subsequently invoked to justify policies that compromised the integrity of science education. He criticizes the National Association of Biology Teachers for claiming (in his words) "that evolution is a science because it *is* like physics" (emphasis in original), whereas, as acknowledged just two pages earlier, the comparison was not advanced in service of such a sweeping claim. Just as a more reflective Mercutio might have credited Romeo at least with trying to stop the duel, so a more thoughtful Giberson might have given creationism's opponents their due.

There is still plenty to appreciate in *Saving Darwin*, especially the discussion of creation science and intelligent design. In such a thoroughly debated area, it is difficult to advance the argument, as Giberson realizes. After explaining his rejection of intelligent design on scientific and theological grounds, for example, he apologizes for the lack of novelty, explaining, "Intelligent design is a nineteenth-century argument, flailing about in a new century where it doesn't belong." But he is familiar with his material, he organizes it well, and he possesses a good eye for the telling detail. A few bouts of whimsy induced a wince, such as the reference to "a leading French intellectual bearing the ponderous name Georges-Louis Leclerc de Buffon"; the Comte de Buffon's given name was Georges-Louis Leclerc, which is two syllables less ponderous than "Karl W. Giberson"—but who's counting? If Giberson's name is comparatively ponderous, at least his prose is not: the writing is generally clear and fluent. Overall, anyone seeking a lively and engaging, if occasionally tendentious, introduction to the evolution wars from the standpoint of a Christian who accepts evolution will enjoy *Saving Darwin.*



Fish Tales

DANIEL GRASSAM

Your Inner Fish: A Journey into the 3.5-Billion-Year History of the Human Body. By Neil Shubin. Pantheon Books, New York, 2008. ISBN: 978-0375-424472. 240 pp. Hardcover, $24.

Owing to a series of unexpected staffing issues at the University of Chicago, author Neil Shubin found himself, a paleontologist, teaching human anatomy to first-year medical students. Despite the seemingly disparate nature of these two topics, Shubin found that being a paleontologist was actually advantageous, "Because the best road maps to human bodies lie in the bodies of other animals." And those roads travel over a period of 3.5 billion years. Who better to discuss billion-year-old history than a paleontologist?

Daniel Grassam writes from Auckland, New Zealand.

Shubin's tale, however, begins a more recent 375 million years ago with a fish. Not just any fish but Tiktaalik, a once-missing-link fossil predicted by paleontology yet undiscovered until Shubin and his colleagues uncovered it in 2006. What makes Tiktaalik important to the narrative is that it is an intermediary between fish and land-living animals, an essential chapter in the human story.

"All fish prior to Tiktaalik have a set of bones that attach the skull to the shoulder, so that every time the animal bent its body, it also bent its head. Tiktaalik is different. The head is completely free of the shoulder. . . . Seeing Tiktaalik is seeing our history as fish," writes Shubin. From our relation to Tiktaalik, Shubin travels through the human body by part and by function. Chapters for hands, head, teeth, vision, smell, and hearing deconstruct our anatomy and expose the links to life's other kingdoms. "When you see these deep similarities among different organs and bodies, you begin to realize that the diverse inhabitants of our world are just variations on a theme."

A laudable facet of *Your Inner Fish* is something that cannot be found in its pages. At no point does Shubin mention creationism, intelligent design, or the purported controversy around evolutionary theory. He gives ID all the attention it deserves by leaving it out completely. The closest that Shubin comes to acknowledging the debate is in the final chapter. In this section, Shubin highlights the impact of our biological past on our present physiology, specifically obesity, heart disease, and hemorrhoids. "Virtually every illness we suffer has some historical component...each of these examples show that we were not designed rationally, but are products of a

convoluted history." He likens that history to "trying to jerry-rig a Volkswagen Beetle to travel at speeds near 150 miles per hour." For Shubin, "we humans are the fish equivalent of a hot-rod Beetle."

More than just a listing of what we know, *Your Inner Fish* makes the reader feel like a part of the discovery process. Relating his own stories of discovery and sharing short anecdotes about the scientists who came before him, Shubin enlivens the material. As he recounts the untimely deaths of scientists who played key roles in fossil discovery and embryology, the setbacks, opportunities missed, knowledge left undiscovered, and sense of loss are palpable. Considering he covers both the paleontological record and embryological knowledge, it is surprising that Shubin managed to pack so much information into 240 pages. His enthusiasm for science and his raconteur style can make you forget you are reading a science book. The simple explanations, frequent illustrations, and Shubin's knack for analogy turn complex details into easy reading.

It's Scary, But Not the Way They Intend

BRIAN THOMPSON

Paranormal State: The Complete Season One DVD set. A&E Home video, release date April 2008.

I watched the entire *Paranormal State: The Complete Season One* DVD set in a single sitting, and I've finally come to terms with the fact that those hours are lost to me. There is no life after death for this wasted time. Indeed, I hope there is no afterlife, so our ghosts can be saved the indignity of being chased by these witless buffoons.

Ryan Buell is the host/perpetrator, though he doesn't demonstrate any of the traditional virtues one expects in a television presenter—likability, varied inflection, personality. In the introduction, he explains that as a child he was terrified by paranormal experiences, so he made it his life's mission to investigate the mysterious. With every investigation, he's one step closer to the truth. Buell doesn't elaborate on what these terrifying experiences were, offer any evidence that they actually occurred, or tell us why we should care. He does point out that sometimes he and his team of dumbfounded, self-styled researchers become warriors. In what capacity is anyone's guess, as they spend most of their time running around in the dark looking confused.

It is questionable whether Buell and his Penn State-based Paranormal Research Society can possibly be considered experts. Buell himself is only twenty-five and started the PRS as a student organization. These are the kind of candle-wielding neo-Pagans you see wearing Tim Burton T-shirts in the New Age section of Barnes and Noble. Every episode begins with the written introduction: "Each year, PRS receives hundreds of reports of paranormal activity . . . only responding to the most severe." But how much experience could these kids rack up in less than six years? And will any of them ever graduate?

For the purposes of this review, I'll focus on a typical episode entitled "Vegas." The PRS crew uses their A&E budget to apparently ignore their academic obligations and fly to Las Vegas, where a fourteen-year-old girl, Savannah, claims to be visited by a dead peer. One wonders what Savannah's mother was thinking when she called a group of paranormal researchers with cameras instead of a licensed psychologist to deal with her daughter's visions. We're told via Buell's obnoxious, tin-can voiceover that the girl has a traumatic past, though it's unclear how exactly she was traumatized. This is a serious issue and another reason why the PRS is wholly unqualified to deal with this young child. That doesn't stop Buell from drawing some kind of parallel between his own allegedly horrific childhood and hers. He thinks he's a real-life Fox Mulder, but this kind of nonsense comes off as irresponsible and exploitative.

Indeed, I hope there is no afterlife, so our ghosts can be saved the indignity of being chased by these witless buffoons.

Brian Thompson writes a weekly science column on the Web site Pink Raygun and does occasional first-person journalism. He also runs the humorous skeptical news blog The Amateur Scientist and hosts two similarly themed podcasts: "The Amateur Scientist Podcast" and the interview-oriented "Inside the Amateur Scientist Studio." E-mail: brianat@gmail.com.

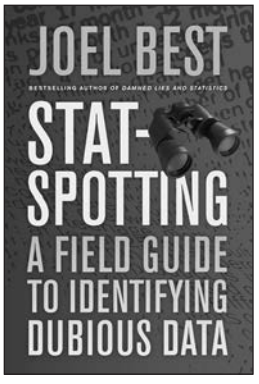
As investigators, the PRS team is worthless. Savannah says her ghostly companion's name is Emily and that she has bruises around her neck as if she were strangled. The PRS crew search Las Vegas's public records but are unable to come up with any violent crimes involving an Emily committed near Savannah's home. For no good reason, they decide to comb through a national database and (surprise!) find a fifteen-year-old named Emily who was strangled to death—only the real-life Emily was murdered in 1990 in San Antonio. Instead of wondering why a ghost would wait seventeen years before manifesting herself in another state, Buell is instantly convinced that this is the ghost they're looking for. And instead of having Savannah describe and corroborate the details of the murder, they show her the police report and *tell her that this is the ghost she's been seeing.*

Buell brings in a parapsychologist to provide a professional opinion on Savannah's condition. Of course the parapsychologist backs up the girl's story. That's why they solicited him. He also rules out the possibility that her dead friend might be a hallucination by claiming that at fourteen, she's too young to be schizophrenic. A two-second Google search will tell you that the peak onset period for schizophrenia is adolescence to early adulthood. Not only are they exploiting this girl, they're giving false medical advice that may not be valid. This has left the realm of crap TV and strikes me as irresponsible.

Paranormal State demonstrates the same trappings as every other half-baked ghost hunting farce. Buell asserts that 3 AM is known as "dead time," when paranormal activity is at its peak. He doesn't back up this claim with anything as mundane as evidence or reasoning. During "dead time," the PRS team sets up motion detectors and infrared cameras. I have no idea how a non-corporeal being would set off a motion detector, and neither does Sergey, the PRS tech guy. The IR cameras are meant to look for "cold spots" in the room, but just like every other ghost hunting show, there's never any explanation as to why ghosts would necessarily make a room cold.

I could go on and on about the true horrors of this pseudo-horror show. There's a disturbing amount of Catholic mysticism—lots of holy water and crosses and blessed icons of the saints buried in the four corners of the property. Taking *Paranormal State* at face value, it's amazing how easy it is to rid a house of an evil spirit just by telling it to go away in Jesus' name. Don't spend too much time thinking about why this would be the case, considering Jesus' dad supposedly created those spirits and could theoretically have stopped them from terrorizing people in the first place.

On one of the DVD commentary tracks, Buell explains his on-the-scene code word for angry demons. He calls them "bunnies." The point here is to confuse them and rob them of their evil majesty. On the off chance that these demons are actually real, I thought I'd give this little trick away. Demons, when you hear Buell running around in the dark blathering about bunnies, that's when you strike. In Jesus' name, that's when you *strike.*



The Information You've Been Provided Ain't Necessarily So

PETER LAMAL

Stat-Spotting: A Field Guide to Identifying Dubious Data. By Joel Best. University of California Press: Berkley, California, 2008. ISBN: 978-0-520-25746-7. 132 pp. Hardcover, $19.95.

Peter Lamal is a fellow of the Division of Behavior Analysis of the American Psychological Association. His book reviews have been published in academic journals, the Charlotte Observer *newspaper, and* SKEPTICAL INQUIRER *and* The Humanist *magazines. E-mail: plamal@carolina.rr.com.*

Upon receiving the new book *Stat-Spotting: A Field Guide to Identifying Dubious Data*, part of my reaction was that it was a slim volume. Soon after I began reading it, however, I concluded that it concisely considers a large number of important questions and provides relevant examples in a helpful and engaging manner. This book follows author Joel Best's 2001 *Damned Lies and Statistics: Untangling Numbers from the Media, Politicians, and Activists* and his 2004 *More Damned Lies and Statistics: How Numbers Confuse Public Issues.* The theme common among the three volumes is that we need to consider statistics and numbers with care. Numbers are generated by people, and it is important to know who counted what, why they counted it, and how they did it. Particularly in mass media reports, however, these factors are often omitted.

The book is divided into sections, each of which focuses on a broad question, such as: who did the counting, and how did they count? Within each section Best identifies problems related to that section's question and lists things that we should be on the lookout for.

Part one's sections emphasize the value of having a framework from which to approach social statistics. It is important to have benchmark figures (e.g., the U.S. population) at ready recall or at hand and an awareness that the worst things (e.g., a college student dying from acute alcohol poisoning) are the least common, contrary to the impression often engendered by mass media.

Part two's first section considers "Blunders" as one of the causes of "Dubious Data." Some of these mistakes might involve attempts to deceive, but often they are the result of errors and confusion on the part of those presenting the numbers. Illustrated with real-life examples, Best describes examples of blunders such as the botched conversion of statistics when translated into simpler language for a mass audience and the use of misleading graphs.

Because some sources present statistics selectively in attempts to convince us that their positions are the correct ones, we need to ask "Who Counted—And Why?" To attract media and consumer attention, numbers that seem surprising, dramatic, or particularly disturbing may be emphasized. But these are only a tiny fraction of all the available numbers. Thus when we see a statistic, we must bear in mind that it has survived a process of selection. Hyperbole is often used to attract attention even though there may be no valid basis for comparison when we encounter such terms as "the biggest" and "the worst."

"Definitions: What Did They Count?" underscores that definitions are important because they determine what gets counted, and every statistic involves some sort of definition; sometimes definitions are changed, which may be justified. But we must understand that the redefined terms are not comparable. One example is *wetlands* being redefined as including "wet-lands," the latter including golf-course water hazards.

Every statistic is the result of a decision to use a specific measurement. In "Measurements: How Did They Count?," Best points out that government statistics such as the unemployment rate are matters of public record, and it is fairly easy to learn how the subjects are measured and to identify problems with the measurements. But advocates of social issues may present us with numbers without explaining how they arrived at their figures. The numbers may be the result of loaded questions. Be alert to survey results that are not accompanied by the survey questions.

Because there are different ways to represent the same quantity, we should be aware of the importance of "Packaging: What Are They Telling Us?" Whether a percentage, proportion, or absolute number is used can result in very different perceptions of a given issue. In using sampling as a research tool, the key question is whether the sample group is representative of the larger population—we should consider whether sampling a different group would have yielded different results. During 2005 and 2006, concerns that avian flu could well become a pandemic resulted from faulty sampling.

There are often debates over data; opponents may present very different numbers about a given topic while criticizing opponents' figures. Often it is possible for us to make sense of "dueling data" if we follow the methods of evaluating data that Best has outlined. Three common subjects for debate about social issues are causality, equality, and policy. In "Debates: What If They Disagree?" Best presents an example of each of the three social issues and alerts us to what to look for in considering such debates.

"Better Data: Some Characteristics" describes three characteristics of better data: they come with information about the methods used to produce them, tend to be subject to debate, and tend to use consistent measures.

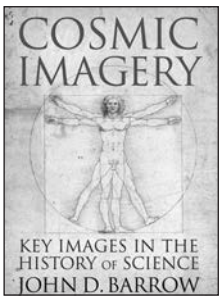
The failure to provide the public with accurate statistics can have widespread societal effects. Bad statistics give us bad information, which can lead to ill-considered public policies. Good statistical information, in contrast, is one of the best ways of understanding the world's complexities.

Stat-Spotting: A Field Guide to Identifying Dubious Data is, like Best's previous two books on statistics, written for the general public and deserves a very wide readership. □

The failure to provide the public with accurate statistics can have widespread societal effects. Bad statistics give us bad information, which can lead to ill-considered public policies.

Listing does not preclude future review.

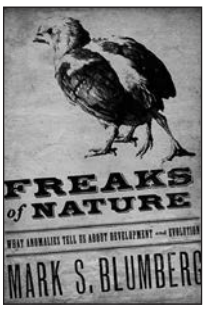
COSMIC IMAGERY: Key Images in the History of Science. John D. Barrow. W.W. Norton, New York, 2008. 600 pp. Hardcover, $35. The dramatic and now-famous "Pillars of Creation" Hubble Space Telescope photo of the star-forming Eagle nebula (which graced the cover of the January/February 1996 SI, only a couple of weeks after NASA released it) is one of the iconic images produced by science. An art historian has compared its impact to the romantic, light-shimmering paintings of the old American West by artists such as Bierstadt and Moran that profoundly affect the human psyche. The Apollo 8 crew's haunting image of a blue-and-white Earth rising over a cold, grey, dead moon on Christmas Eve 1968 helped start the modern environmental movement. The first maps of geological strata, the periodic table, bubble chamber tracks, the prehistoric Laetoli hominid footprints, Alexander von Humboldt's clever painting plotting the variation of equatorial flora and fauna according to altitude on a profile of the Chimborazo volcano in Ecuador—these and countless other images have influenced science and its public perception. Cambridge University mathematician and science author John D. Barrow presents a book about scientific imagery—definitive images, graphs, pictures, and charts that play a key role in widening our appreciation for the world. Some of the images are subtle, others have an aesthetic quality but also an important scientific subtext. Each carries with it a story, which Barrow presents with clarity and erudition. Sometimes the story is about its creator, sometimes it's about a new technology that made the image possible, and sometimes it's about the image's assumed "unforeseen importance, which stimulated an entirely new way of thinking." As science has become ever-more visual not just in its presentations but in its very practice (visualizations of supercomputer simulations, for example), Barrow finds it useful to think about the role of images in science, not just today but over many hundreds of years. — K.F.



CRITIQUE OF INTELLIGENT DESIGN: Materialism versus Creationism from Antiquity to Present. John Bellamy Foster, Bret Clark, and Richard York. Monthly Review Press, New York, 2008. 240 pp. Softcover, $15.95. The "intelligent design" movement is far more than an attack on evolutionary biology; it is the latest manifestation of a 2,500-year critique of materialism dating back to the ancient Greeks. The authors, all sociologists, reverse that critique and describe the long critique of intelligent design (creationism) out of which the modern scientific worldview emerged. They examine this millennia-long controversy within Western thought as it bears on social science as well as natural science, philosophy, religion, and politics as well as the church. — K.F.

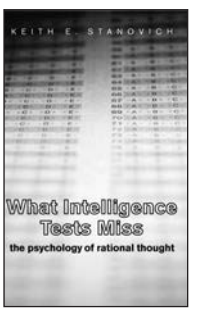
DEADLY DECISIONS: How False Knowledge Sank the Titanic, Blew up the Shuttle, and Led America into War. Christopher Burns. Prometheus Books, Amherst, New York, 2008. 360 pp. Hardcover, $26.95. We live in a world, says this former news executive (Washington Post Company, Minneapolis Star & Tribune, now an information management consultant), where many of the things we believe cannot be confirmed and some are simply not true. Burns attempts to clarify these failures in detail so the pattern of error can be spotted when it occurs again. "The biology of the brain, the behavior of groups, and the structure of society provide surprising clues as to why individuals and groups succumb to wishful thinking, information overload, and the unintentional twisting of facts." The hope is that with better understanding of our own information-handling behavior, we might learn to make more successful decisions. — K.F.

FREAKS OF NATURE: What Anomalies Tell Us About Development and Evolution. Mark Blumberg. Oxford University Press, New York, 2008. 326 pp. Hardcover, $22.95. The public has always been fascinated by freaks and human anomalies, from ancient times to the carnival sideshows to the occasional news stories about freak births. (A girl in India made international news in 2005 when she was born with eight limbs; she was claimed by some to be a goddess.) Author Mark Blumberg, editor-in-chief of the journal *Behavioral Neuroscience*, examines freaks from an evolutionary perspective and argues that deformities are simply alternative paths for development. Blumberg writes, "The boundary between novelty and anomaly is a fuzzy one. After all, bodily forms considered anomalous in one species can signify novelty in another. For example, some humans are born without arms or legs, but all snakes are born that way. We may properly characterize limblessness as an anomalous feature in an individual (in relation to other humans), but as a novel feature of snakes (in relation to other reptiles). But such characterizations do not move us any closer to an appreciation of the shared developmental processes that underlie limblessness in humans and snakes." An interesting and insightful evolution-based examination of a curious topic. — B.R.



BIGFOOT ENCOUNTERS IN NEW YORK AND NEW ENGLAND. Robert Bartholomew and Paul Bartholomew. Hancock House, Blaine, Washington, 2008. 172 pp. Softcover, $24.95. Though Bigfoot is most often claimed to be sighted in the Pacific Northwest, the huge, mysterious, probably nonexistent creatures have in fact been seen in nearly every one of the United States. Robert Bartholomew (a sociologist now living in Darwin, Australia) and his brother Paul (of New York) have researched Bigfoot for more than thirty years, and their book focuses on the sightings and evidence in New York and New England. Christine Marie Janis, a professor of ecology and evolutionary biology at Brown University, seems unfamiliar with the topic and makes several unfortunate gaffes in the book's foreword (such as suggesting that Chinese tourists in Upstate New York could have no preconceived idea of Bigfoot's appearance, as if news stories and media depictions hadn't made it to 2004 Hong Kong). But the bulk of the book, by the Bartholomews, is better. The focus is on sightings, and the authors provide an exhaustive (though not always detailed) catalog of alleged Bigfoot encounters spanning from "long ago" to 2006. The book contains some curious omissions; for example, in the discussion of "Bigfoot footprints" (dermal ridges), the authors don't mention the solid skeptical research done years ago by Mike Dennett and Matt Crowley showing conclusively how the "toeprints" can be accidentally created in the process of casting tracks. The book also discusses various theories about Bigfoot's nature and origin. Though there's little actual investigation, this collection of Bigfoot accounts is interesting from a historical and research perspective. —B.R.

WHAT INTELLIGENCE TESTS MISS: The Psychology of Rational Thought. Keith E. Stanovich. Yale University Press, New Haven, Connecticut, 2008. 328 pp. Hardcover, $30. Cognitive scientist Daniel Kahneman and his colleague Amos Tversky (who died in 2006) received the 2002 Nobel Prize in economics for discovering "how judgment under uncertainty systematically departs from the kind of rationality postulated in traditional economic theory." Keith Stanovich (University of Toronto and author of *How to Think Straight About Psychology*) considers that some people are better than others at avoiding or overcoming errors of judgment and decision making that we are all prone to some of the time. These systematic individual differences in judgment and decision making mean there are variations in important attributes of human cognition related to rationality. Yet we talk as if the term *intelligence* encompasses rationality, when it does not: "The items used to assess intelligence on widely accepted tests bear no resemblance to measures of rational decision making," he says. This explains "smart people doing dumb things"—because IQ tests do not measure adaptive decision making. "Rational thinking skills of the type studied by Kahneman and Tversky show only small-to-medium correlations with intelligence test performance," says Stanovich. Rational thinking skills relate to goal achievement in the real world, yet we focus too little on them. His book describes cognitive research supporting these views and shows what might be accomplished if schools, businesses, and government focused on what intelligence tests miss. — K.F.



—Kendrick Frazier and Benjamin Radford

How to Get Rich Quickly with 'Alternative' Medicine

EDZARD ERNST

"Alternative" medicine is undoubtedly popular and therefore profitable. The latest report from Mintel, a London-based marketing research company, showed an increase of 24 percent in sales of homeopathic medicines over the last five years. Some treatments commonly labeled as "alternative" are demonstrably effective, but most are unproven or disproven. So how is it that so many people are so successful at selling bogus treatments? Much of the answer lies in clever marketing. Here are some fool-proof strategies for setting up a thriving business in bogus remedies:

- Whatever you do, always pretend that convincingly positive evidence exists for the efficacy of your remedies. This lie is, of course, as popular as it is essential for profit. Currently there are millions of Web sites promoting countless forms of alternative medicine; the vast majority indulge in exactly this fabrication.
- Stress that your treatment is natural. To lay people this automatically implies an absence of risks; ignore the fact that hemlock is natural yet more than just a trifle unhealthy. Even the U.K. government recently adopted this deception by naming a regulatory body for "alternative" practitioners "The Complementary *Natural* Health Council" (emphasis added) (www.fih.org.uk-/media_centre/natural_healthcare.html).
- Emphasize that your treatment has been around for hundreds of years. This implies that it has "stood the test of time." In this context, Prince Charles likes to speak of "ancient wisdom," which has in many cases killed more people than it cured—like bloodletting, for instance. But if you want to get rich, you must be economical with the truth.
- Highjack core elements of medicine and pretend they are unique to your type of healthcare. Point out, for instance, that your treatment is holistic and offers an individualized approach. Do not mention that good, conventional medicine is, by definition, holistic and individualized.

If your alternative therapy has already been widely exposed as quackery, do not despair. A slightly modified marketing strategy can still bring success:

- State that most of conventional medicine (80 percent is a popular figure) is also not evidence-based. Never mind that this figure has repeatedly been disproven—people won't fact-check it, and they will see your point: if conventional medicine is not flawless, you must be allowed to do anything you want.
- Stress that your therapy cannot possibly be submitted to scientific scrutiny. Never mind that your arguments do not hold water: a surprising number of people find antiscience much more attractive than science, and a lack of rationality has been shown to predict usage of "alternative" medicine.
- Point out that clinical trials are extremely misleading because they tell us nothing about the individual. Since we are all different—you should elaborate—studying groups of patients is meaningless for informing us what does and doesn't help the next patient.
- Emphasize the overwhelming importance of the aphorism: "If it helps my patients, I don't need scientific proof!"

Selling bogus remedies might, of course, earn you not just money but occasional harsh criticism. Should you ever be attacked as a fraud, an age-old strategy may be your best bet: the ad hominem attack.

- Argue that your opponent is an utterly incompetent and notorious quack-buster. He knows nothing about the complex nature of your treatment—so how dare he criticize it!
- Imply that your opponent is deep in the pocket of the pharmaceutical industry and paid generously for denouncing natural treatments like yours. This has the added value of suggesting that the pharmaceutical industry knows about the effectiveness of your approach, which can only be good for business.
- Convince people that your enemy has only one reason for his derogatory comments: to distract from the fact that not you but he is the impostor who has committed any manner of health fraud, violation of medical ethics, or other crimes.

Following this simple marketing strategy, your bogus remedy will be a hit. You will effortlessly earn pots of money, and you might even gain a few satisfied customers whose endorsements can be posted on your Web site. Trust me; I have seen it happen many times! □

Edzard Ernst, MD and PhD, is co-author with Simon Singh of Trick or Treatment: The Undeniable Facts about Alternative Medicine, *W.W. Norton, New York, 2008.*

What Do Skeptics Need to Explain?

DALE BEYERSTEIN

Robert Sheaffer has (along with James Alcock and Ray Hyman) given skeptics a piece of really good advice: "Before we try to explain something, we should be sure it actually happened" (2008). But he has made it more difficult to follow this advice by christening the failure to follow it "*The* Fallacy of Misplaced Rationalism" (emphasis added). The definite article here suggests that there is only one way to fail to follow the advice. But the series of examples Sheaffer uses to illustrate the fallacy show that this is not the case. These examples confirm that there are in fact many ways to run afoul of this advice. Actually, the real culprit is the word "it" in the original advisement; the word suggests that there is one thing that we all agree needs explaining, and the trick is merely to find the right explanation. But things are more complicated than this.

The first example Sheaffer gives, that of the Star of Bethlehem, most clearly illustrates the type of case where the advice is most useful: I agree with Sheaffer and the majority of liberal theologians that there was no unusual object in the night sky on the night of Jesus' birth that people mistook for a star; hence there is no need to speculate about what that nonexistent object might have been. But this does not mean that skeptics need not provide *any* explanation; we still need to explain why the story of the star has been told and retold. And this explanation, as Sheaffer himself notes, revolves around the early Christians' need to have Jesus born in Bethlehem rather than Nazareth in order to fulfill the predictions of a messiah found in the Old Testament books of Isaiah and Micah.

Skeptics are inveterate explainers. Contrary to the popular stereotype of the debunker who dismisses a claim by shouting "Bullshit!" and walking away, the skeptic is usually the one to say "That's bullshit *because*. . . ." What follows the "because" will be an alternative explanation. But what is the *it* that is to be explained? I suggest that there are four types:

1) We might disagree with the explanation proffered by true believers for the event in question, but there is no question that something took place that needs explaining. For example, most skeptics and conspiracy theorists alike agree that John F. Kennedy was indeed assassinated on October 22, 1963, but the former insist that the event took place thanks to a lone assassin, while the latter offer any number of alternative explanations involving different combinations and permutations of agents.
2) We might be explaining the cause of a true believer's perceptions and mental processes that led this person to think that an event of a certain type took place. When we think that the person has misunderstood the event in question—that is, an event did take place but not the one the true believer thought happened—it is no longer clear that the skeptic and the true believer are talking about the same *it*. For example, when a person thinks that the UFO he reports is a nuts-and-bolts spaceship, the skeptic may explain the event in terms of the way our perceptions work. The explanation, for example, may focus on our inability to accurately measure the distance an object is away from us when we do not know its size or vice versa. So, the skeptic will offer the Goodyear Blimp as the *it* that the true believer saw; whereas the true believer will insist that it must have been some other *it*.
3) A related sort of explanation is what we might call a *purely* psychological one, as would be the case when we trace a person's apprehension of a ghost to a case of hypnogogic dreaming as when a person, having just fallen asleep, superimposes dream matter onto a perception from the room in which he is located. In this case there is no *it* that was mistaken for some other *it*: there is no living person or actual object that he has confused with his dead Aunt Agatha; her "presence" is the stuff of memories and dreams. As an aside, we might note that these types of explanations are the ones that most anger the true believer ("The skeptic thinks that it is all in my head"); so the skeptic is well advised to distinguish Type 2 explanations from

Dale Beyerstein teaches philosophy at Langara College in Vancouver, Canada, and is one of the founding members of the B.C. Skeptics. E-mail: dbeyerstein@langara.bc.ca.

Type 3 unless he actually *means* to imply that it is all in the true believer's head. Despite the fact that skeptics most often mean to offer a Type 2 explanation, it is not always easy to distinguish the two, since there is a large grey area at the borders of these types. These are the cases in which something in the real world serves as the basis of the perception, but psychological factors so confuse it as to render it impossible for skeptics to recognize it.

4) The last broad category I shall mention is that exemplified by the Star of Bethlehem example in which there is nothing to explain but the story itself: "Why would anyone tell that story if there was no bright star in the sky that night?" "Because it struck the authors of the story, inventing it decades after the time of Jesus, as a fitting item to include in a story about the birth of a God." As the example suggests, this is the case involved when we are explaining why someone (or some group) would tell a lie. In other words, we are explaining the telling of the story rather than something within the story. And note that an accusation of lying is often thought to be the most charitable explanation for why someone could say something so manifestly at variance with what sensible people would take to be the case. The alternative explanations involve some sort of perceptual, emotional, or psychological fault in the storyteller that may be more embarrassing than being caught lying . To be sure, to accuse a person of lying is to accuse them of a moral failure. But while it is usually the case that it is better to be thought a fool than a knave, this depends on the extent of the foolishness we have to attribute. Even though a conman is a moral failure, who can deny that he gets *something* right if he is at all successful? That *something* may be the crux of an interesting explanation of why a person would say something demonstrably false. My present point is that the explanation now turns on why someone would find it to their advantage to be believed as opposed to explaining why they in fact believe it themselves. We might also try to explain how they "pulled it off"—for example, how they did the trick photography or how they substituted the bent spoon for the straight one.

So, as I said, there is always *something* for the skeptic to explain. The advice of Sheaffer, Hyman, and Alcock is useful as long as it is not taken to be the claim that sometimes there is nothing to explain but rather the advice to explain the *right sort* of thing. Of course this advice is not easy to follow for two reasons: first, sometimes there are grey areas in which it is difficult to determine what sort of explanation we are giving; and second, we sometimes need to give explanations at more than one level.

In the first case, when we begin our attempt to explain a UFO phenomenon, we may begin with the assumption that there was an object in the sky that people mistook for an extraterrestrial craft. When the evidence doesn't support this, we may switch to something else, and so on until we arrive at a satisfactory, if provisional, account.

In the second case, a very complete explanation may involve more than one of these types given above. I have already alluded to the way in which Type 2 blurs into Type 3: sometimes the brain makes the image out of whole cloth, sometimes from a single fiber, sometimes literally from nothing. But also take Type 4: after identifying some story as nothing but a lie, we may still want to explain how the hoaxer made the scale model from which to make his fake photographs.

There is always *something* for the skeptic to explain. The advice of Sheaffer, Hyman, and Alcock is useful as long as it is not taken to be the claim that sometimes there is nothing to explain but rather the advice to explain the *right sort* of thing.

So the wisdom in advice from Alcock, Hyman, and Sheaffer is to not get caught up positing implausible events or processes just because they are less implausible than the ones offered by the true believer. But this does not mean that the skeptic needs to offer no explanation at all; it means that what is needed is an explanation of the right type, depending on the *it* needing explanation. If we need a name for a fallacy committed when this advice is not heeded, instead of calling it the Fallacy of Misplaced Rationalism, we might christen it the Fallacy of Offering the Wrong Type of Explanation.

Reference

Sheaffer, Robert. 2008. The fallacy of misplaced rationalism. SKEPTICAL INQUIRER 32 (4), 23–24.

FOLLOW-UP

Critique of 'The Bipolar Bamboozle'

NIGEL BARK

As a psychiatrist, I see a lot of adults diagnosed with bipolar disorder. Yet I am a bit skeptical of the expansion of the diagnosis of the disorder and concerned about the great increase in treatment of bipolar children. I expected a reasoned, science-based article on this subject in SKEPTICAL INQUIRER. Unfortunately, "The Bipolar Bamboozle" by Stephen Flora and Sarah Bobby in the September/October 2008 issue is an unscientific polemic against drug companies and those who treat bipolar disorder that distorts and misuses its sources and ignores the severe suffering and disability of those diagnosed with bipolar disorder.

Mental illnesses are not trivial. Depression is the leading cause of disability worldwide in those five and older, causing 10 percent of all disability. Bipolar disorder ranks sixth, causing 3 percent (ref: HMI), with considerably more disability caused by the disorder in developing countries than in high-income countries (Disease Control Priorities Project 2006).

There are strict criteria for the diagnosis of bipolar disorder in the DSM IV, the current Diagnostic and Statistical Manual used in the United States and around the world. The authors state on page 42 of their article that before DSM III, a patient had to be hospitalized with mania to be diagnosed as manic-depressive (the earlier name for bipolar disorder). That is untrue. There is no mention in DSM II (1968) of hospitalization in the criteria for diagnosing someone as manic-depressive. There is in DSM III (1980), but only if the episode is less than one week long. Thus, there has been no "softening" of the criteria for diagnosing Bipolar I.

The comparison of the child with the hammer with the discovery of lithium (page 42) is totally inappropriate. Lithium is well proven as a treatment and preventative for mania and to a lesser extent for depression and suicide. Because it was so effective in treating bipolar disorder but not schizophrenia, it became important to differentiate these. As the quote on page 42 makes clear, the increase in bipolar disorder was from schizophrenia. There was no broadening of the concept here. The U.K./U.S. diagnostic project (Kendell et al. 1971) also clearly showed that schizophrenia was over-diagnosed in the eastern United States with the inclusion of mania.

The authors misstate what kindling is (page 42) and misconstrue its relevance. Kindling is not the initial firing of neurons in a seizure. It is the process by which repeated seizures (epilepsy) and by analogy manic episodes (bipolar disorder) might be caused by a limited series of repeated stimuli that singly would be too small to precipitate a seizure. But neither this theory nor its analogous application to bipolar is the reason anticonvulsants are used. Valproate (later Depakote) and other anticonvulsants were found to have psychotropic effects in 1968 and to be effective in treating bipolar disorder long before the kindling theory was published in 1989 (Harris et al. 2003).

The authors' comparison (page 43) (Harris et al. 2005) of hospital admissions in the 1890s to those in the 1990s in north Wales is extremely interesting and a little worrisome in raising the possibility of medication changing the long-term outcome of bipolar disorder treatment. But in describing the decreased percentage of "recovered" hospital discharges, the authors left out an extremely important bit of information from that article: the average length of stay in the hospital in the 1890s was 239 days; in the 1990s it was thirty-six days. Which would you prefer? Perhaps it is the short hospitalizations and not the drugs that are altering the outcome of bipolar disorder treatment.

The authors' statements (page 43) from the Harrow articles on the outcome of schizophrenia are grossly misleading. Saying "schizophrenia patients are eight times more likely to recover if they are *not* on medications" is not stated in the Harrow articles and is not true. The Harrow study was not a randomized placebo-controlled trial of medication (which would be needed for such a conclusion to be drawn) but a naturalistic follow-up study. Those with indicators of good prognosis (presumably "milder" schizophrenia) did better and were able to stop their medication after several years. It was not possible at the start to predict who those patients would be or to know if they would have done better had they never been on medicine. There is overwhelming evidence confirmed repeatedly over fifty years that antipsychotic medication reduces hospitalization, relieves suffering, and improves the quality of life of nearly everyone with schizophrenia. Some people are able to stop it after a few years, but most are not.

Criticism of drug companies (pages 42–44) is fashionable these days, but drug companies are in business to make

Nigel Bark, MD, is associate professor of clinical psychiatry, Albert Einstein College of Medicine; supervising psychiatrist, Bronx Psychiatric Center, Bronx, New York; and trustee, American Council on Science and Health. E-mail:brmdnbb@omh.state.ny.us.

money by creating new drugs that contribute to our ever-increasing life expectancy (and my personal well-being). It is great that drug companies (and others) investigate other indications for drugs that are already on the market. It is cause for celebration, not criticism, that the anticonvulsants Depakote and Carbamazapine are very good for mania and that some of the new antipsychotics are also antimanic, antidepressant, and have been shown to reduce episodes of mania and depression over two years (which surely can be called "mood-stabilization"). They can only be approved for these additional uses by the FDA on the basis of double-blind controlled trials.

I, too, have doubts about expanding the definition of bipolar disorder, but it should certainly be considered and examined scientifically. If people with the "expanded" diagnosis have the same genes or environmental risk factors as with the narrow definition, expanding the definition might be beneficial. And if the expanded diagnosis includes people with recurrent depression not alleviated by antidepressants but who do respond to lithium and mood stabilizers (and there is some evidence that this is so), then it would be useful. It does not mean that we have to treat cyclothymia or hypomania with antimanic drugs, but it is certainly worth considering. I should point out that Akiskal's patients (page 43–44)—for whom he looked at a greatly expanded concept of bipolar disorder—were not people with "normal happiness and sadness" but were attending a mental health clinic, presumably with some suffering or disability. They were not the "population at large" as is implied in the quotation by omitting eleven lines and the end of the last sentence of the passage they quote from Akiskal's paper. The last two lines refer to a different study, not patients, that reads in the original: "The subthreshold oscillation of hypomanic and subdepressive periods occurring in 6.3% of the population at large [ref], represents a high risk group predisposed to major affective episodes." The bipolar spectrum disorders as discussed by Akiskal do not include patients with sub-*psychiatric* syndromes as the authors imply but sub-*bipolar* syndromes in addition to major depression.

There is indeed a great increase in the diagnosis of bipolar disorder in children and adolescents, which is a cause for concern and study. What this means is unclear. The article (Blader and Carlson 2007) that the authors cite in the section titled "Upcoding" (page 44) does not in fact give any evidence for "upcoding"; this is merely one of several speculative causes of the increase. However, there is a severe shortage of psychiatric beds for children, and those children who do get admitted are severely distressed and disturbed and are a great burden and worry to their families (see, for example, Egan 2008). If you have to "upcode" to ensure that these parents do not have to pay "out of pocket" for the hospitalization of their child, so be it. These children have multiple severe symptoms and problems that do not easily fit into the discrete categories of DSM IV. One can argue conscientiously for a number of different diagnoses.

Incidentally, the Blader and Carlson article destroys the authors' argument about the broadening and softening of the diagnosis. The number of bipolar children had increased, but the proportion that were not Bipolar I (Bipolar I being the original, narrow definition) went from 4–5 percent to 1–4 percent between 1996 and 2004: no increase and overall a very small proportion of all bipolar diagnoses.

The drugs used in treating bipolar disorder are certainly powerful drugs with many side effects that must be used judiciously, but they are used for a severe and disabling condition. They are not prescribed for "normal people dealing normally with ordinary life issues," and the authors cite no evidence to support this assertion, creating a "straw man" for this error-prone, unsubstantiated attack on the diagnosis and treatment of bipolar disorder.

References

Akiskal, H.S., M.L. Bourgeois, J. Angst, R. Post, H.-J. Moller, and R. Hirschfeld, 2000. Re-evaluating the prevalence of and diagnostic composition within the broad spectrum of bipolar disorders. *Journal of Affective Disorders* 59:S5–S30.

Blader, J.C., and G.A. Carlson 2007. Increased rates of bipolar disorder diagnosis among U.S. child, adolescent, and adult inpatients, 1996–2004. *Biological Psychiatry* 62:107–114.

Disease Control Priorities Project. Available online at www.dcp2.org/file_fs/306/1.ppt.

DSM: American Psychiatric Association: Diagnostic and Statistical Manual II (1968), III (1980). IV-TR (2000). Washington, D.C., American Psychiatric Association.

Egan, J. 2008. The bipolar puzzle. *The New York Times Magazine*, Sept 14.

Harris, M., S. Chandran, N. Chakraborty, and D. Healy. 2005. The impact of mood stabilizers on bipolar disorder: The 1890s and 1990s compared. *History of Psychiatry* 16:423–434.

Harris, M., S. Chandran, N. Chakraborty, and D. Healy. 2003. Mood stabilizers: The archeology of the concept. *Bipolar Disorders* 5:446–452.

Harrow, M., and T.H. Jobe. 2007. Factors involved on outcome and recovery in schizophrenia patients not on antipsychotic medications: A 15-year multi-follow-up study. *Journal of Nervous and Mental Disorders* 195: 406–414.

Harrow, M., L.S. Grossman, T.H. Jobe, and E.S. Herbener. 2005. Do patients with schizophrenia ever show periods of recovery? A 15-year multi-follow-up study *Schizophrenia Bulletin* 31:723–734

HMI World. 2004. Mental illness and the global burden of disease. *Harvard Medical International* (March/April). Available online at http://hmiworld.org and www.who.int/features/factfiles/global_burden/en/index.html.

Kendell, R.E., J.E. Cooper, A.J. Gourlay, J.R.M Copeland, L. Sharpe, and B.J. Gurland. 1971. Diagnostic criteria of American and British psychiatrists. *Archives of General Psychiatry* 25:123–130.

Disclosure: I treat patients, both in private practice and in a public hospital, with severe mental illnesses, including schizophrenia and bipolar disorder, with medication that I believe helps greatly on the whole but for many is inadequate with too many side effects. We desperately need better medicines.

I am proud to have been involved with drug-company sponsored research during the past eighteen years with the new anti-psychotics in the treatment of schizophrenia (but not bipolar disorder) at no financial benefit to me. I have on half a dozen occasions during this time been a consultant or teacher of rating scales for drug companies but not in the past two years. The following were the companies involved: Janssen, Sandoz, Abbott, Lilly, Astra-Zeneca, Bristol-Meyer Squibb, Hoechst-Marion Roussel, Novartis, Pfizer.

Although the authors of "The Bipolar Bamboozle" do not mention conflict of interest, Stephen Flora clearly has some, both philosophical and financial, given the title of his book.

Response to Critique of the 'Bipolar Bamboozle'

STEPHEN FLORA

The critique by Nigel Bark, whose work has been sponsored by ten drug companies, is disingenuous and furthers the bamboozle. Of course antipsychotics were used for years before the kindling hypothesis was proposed. Kindling was offered *post hoc* in an attempt to justify years of drugging without any scientific rationale—a practice common in psychiatry (e.g., Gelman 1999).

Of course there is no "softening" of bipolar I; we never claimed that, contrary to Nigel's straw man argument. It is *psychiatry's invention* of bipolar II, hypomanic episodes and cyclothymic disorders, that constitutes the softening into a "spectrum." Apparently I and II are not enough; Akiskal is now "validating" types II, III, and IV (e.g., Akiskal et al. 2006). Which size fits you? Psychiatrists proclaim: "This field has progressed . . . from a core disease concept to a broad spectrum, which subsumes severe hospitalized patients as well as those attenuated cases in the community" (Pichot 2006). Sounds like "the population at large" to me.

This disease-mongering by psychiatry and pharmaceutical companies has resulted in a forty-fold increase in "diagnoses" of bipolar in U.S. children from 1995 to 2003 (Moreno et al. 2007); a rate over 500 times that of Germany (Holtmann et al. 2008), which unlike the U.S. does not allow direct-to-consumer advertising by drug companies. Psychiatrists warn their brethren, "the diagnosis must be reliable [it is not] . . . there must be concern about the widening of the definitions of bipolar disorder described in adults. The risk may be that diluting the concept will lead to a trivalisation of the disorder" (Bhagwagar and Goodwin 2004). Indeed, over half the diagnoses for bipolar are wrong (Zimmerman et al. 2008).

The most egregious bipolar bamboozler may be Joseph Biederman, who began arguing in the 1990s that many cases of ADHD (another overused and misused label) actually were cases of bipolar (Wozniak, Biederman, and Kiely 1995). Currently Biederman is under investigation by Harvard, Massachusetts General Hospital, and U.S. Senator Charles E. Grassley (R-Iowa) for not reporting well over $1.2 million in payments from Johnson & Johnson, makers of the antipsychotic drug Risperdal (given to children labeled "bipolar"). Court documents, including court-obtained internal company emails, indicate money was paid to "generate and disseminate data supporting the use" of Risperdal in children and to counter negative reports, including research results showing that a placebo worked as well as Risperdal. That's not objective science. Last year more than 389,000 children, including preschoolers, were given Risperdal. Between 1993 and 2008, 1,207 children suffered serious problems from Risperdal, including thirty-one deaths (Harris 2008). Parents have filed thousands of lawsuits against the makers of Risperdal, Zyperxa, Seroquel, Geodon, and Ambilify, all given to children for bipolar (including some "off label"). In an understatement on November 18, 2008, an FDA panel concluded antipsychotic medicines were overused in children and the FDA needed to do more. When it comes to bipolar don't be bamboozled, be skeptical.

Stephen Ray Flora is a psychology professor and behavior analyst at Youngstown State University and author of Power of Reinforcement *(SUNY Press 2004) and* Taking America off Drugs: Why Behavioral Therapy is More Effective for Treating ADHD, OCD, Depression, and Other Psychological Problems *(SUNY Press 2007). E-mail: srflora@ysu.edu.*

References

Akiskal, Hagop S., et. al. 2006. Validating the bipolar spectrum in the French national EPIDEP study: Overview of the phenomenology and relative prevalence of its clinical prototypes. *Journal of Affective Disorders*, 96, 197–205.

Bhagwagar, Zubin, and G.M. Goodwin. 2006. Bipolar-spectrum disorders: An epidemic unseen, invisible or unreal? *Advances in Psychiatric Treatment*, 10, 1–3.

Gelman, Sheldon. 1999. *Medicating Schizophrenia.* New Brunswick, N.J. Rutgers University Press.

Harris, Gardiner. 2008, November 25. Research center tied to drug company. *New York Times.* Available online at www.nytimes.com/2008/11/25/health/25psych.html.

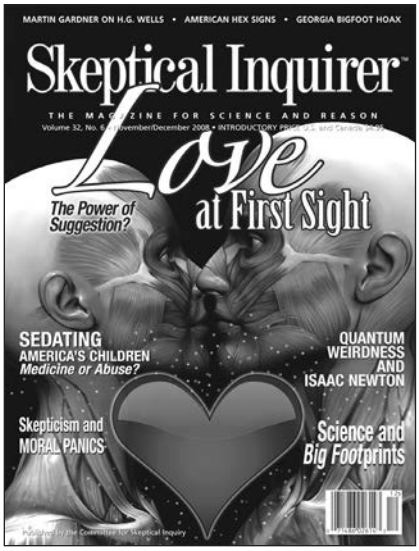
Holtman, Martin, S. Bolte, and F. Poustka. 2008. Rapid increase in rates of bipolar diagnosis in youth: "True" bipolarity of misdiagnosed severe disruptive behavior disorders? *Archives of General Psychiatry*, 65, 477.

Moreno, Carmen, et al. 2007. National trends on the outpatient diagnosis and treatment of bipolar disorder in youth. *Archives of General Psychiatry*, 64, 1032–1039.

Pichot, Pierre. 2006. Tracing the origins of bipolar disorder: From Falret to DSM-IV and ICD-10. *Journal of Affective Disorders*, 96, 145–148.

Wozniak, J., J. Biederman, and K. Kiely, et al. 1995. Mania-like symptoms suggestive of childhood onset bipolar disorder in clinical referred children. *Journal of the American Academy of Child and Adolescent Psychiatry,* 34, 867–876.

Zimmerman, Mark, C.J. Ruggero, I. Chelminski, and D. Young. 2008. Is bipolar overdiagnosed? *Journal of Clinical Psychiatry*, 69, 935–940.


MARTIN GARDNER ON H.G. WELLS • AMERICAN HEX SIGNS • GEORGIA BIGFOOT HOAX
Skeptical Inquirer
THE MAGAZINE FOR SCIENCE AND REASON
Love at First Sight
The Power of Suggestion?
SEDATING AMERICA'S CHILDREN Medicine or Abuse?
QUANTUM WEIRDNESS AND ISAAC NEWTON
Skepticism and MORAL PANICS
Science and Big Footprints

Sedating America's Youth: Strong Reactions For and Against

"The Wholesale Sedation of America's Youth" (SI, November/December 2008) should be required reading for every person literate enough to do so, no matter what age.

As someone who has been "screaming" about this issue for at least two decades, I cannot express how morally repugnant—nay, criminal—I believe the unnecessary medication of children to be. A large part of my ministry is counseling, including children and families. I cannot help but cry (privately) when I encounter medicated children who almost certainly do not require it and parents who "buy into" the mindset created largely by the pharmaceutical industry and "complicit" psychologists and psychiatrists.

Ironically, SI's article came just weeks ahead of an article in *The New York Times* reporting on a panel of federal drug experts who found that "Powerful antipsychotic medicines are being used far too cavalierly in children," citing, among others, Risperdal, Zyprexa, Seroquel, Abilify, and Geodon. The panel said that "current [label] warnings [are] not enough." They also noted that Dr. Joseph Biederman, a child psychiatrist at Harvard who is the leading advocate of "bipolar diagnosis," is "under a cloud after a Congressional investigation revealed that he failed to report to his university at least $1.4 million in outside income from the makers of antipsychotic medicines." However, the most chilling finding was that from 1993 through 2007, "1,207 children given Risperdal suffered serious problems, including 31 who died. . . . At least 11 of the deaths were children whose treatment with Rispedal was unapproved by the F.D.A."

One passage in your article jumped out at me, as it sums up the primary argument I have been making for years: "What if children are the same as they always were? After all, virtually every symptom now thought of as diagnostic was once an aspect of temperament or character. We may not have liked it when a child was sluggish, hyperactive, moody, fragile, or pestering, but we didn't ask his parents to medicate him with powerful chemicals either. . . . What if it is only our perception of childhood that has changed?"

Much more needs to be done to stem the tide of medicating children who probably don't need it. Hopefully, between the scientific community, Congress, and the media, a greater degree of propriety, prudence, and (dare I say it?) sanity will take hold, and those children whose issues are related to "temperament or character" will be allowed to be children again without being unwillingly subjected to what is likely to become a lifelong dependence on unnecessary medication.

Rev. Ian Alterman
New York City

Regarding Andrew Weiss's "The Wholesale Sedation of American Youth," it is gratifying to me to see such important articles appearing in the SKEPTICAL INQUIRER in recent issues.

I retired from psychiatry fifteen years ago in disgust over the abandonment of dynamic psychiatry in favor of the medical model, i.e., all emotional distress should be identified in the APA diagnostic manual as a disease to be treated with a pill. When an exhaustive study attributing our epidemic of depression in the workplace to stress, not genetics, was ignored, I felt anger. The drug companies were running my professional life, and most patients wanted a quick fix, a pill. I thought, if Dennis the Menace came to me I would have to diagnose him as ADD and medicate him to avoid threats of malpractice. Further, as I recalled my somewhat hyperactive childhood, I would today probably receive life-long medication!

I am going to try to place copies of the article in our local library and volunteer to teach a course for parents on this subject. It is gratifying to have what I believed so many years ago so thoroughly validated. Thank you.

Warren A. Baker, MD
Livermore, Colorado

Weiss is right, and the November 2008 edition of *Pediatrics* shows that the problem is getting worse. For example, the use of stimulant drugs (Ritalin, Adderall, etc.) to treat attention deficit/hyperactivity disorder (ADHD) increased 40.4 percent from 2002 to 2005. I have three reasons for believing that the use of these stimulant drugs is bad practice:

1. *The evidence indicates that ADHD doesn't exist.* In a 2008 review of the literature on ADHD, Furman concludes that: "ADHD is unlikely to exist as an identifiable disease. Inattention, hyperactivity, and impulsivity are symptoms of many underlying treatable medical, emotional, and psychosocial conditions affecting children."
2. *Even if ADHD exists, its diagnosis is as random as roulette.* Most diagnoses of ADHD are made by family physicians, who usually have no training in recognizing ADHD and who never see how a child behaves in the classroom. Since the pharmaceutical salesman and the ads in the medical journals say Adderall helps behavior problems, the physician writes a prescription and tells the parents, "Have him take this and see if it helps." Because stimulant drugs make all children more attentive, complete more assignments, etc., it helps. Using this method of diagnosis, all children have ADHD.
3. *Stimulant drugs don't improve a child's progress in school.* A National Institute of Health Consensus Report of experts on ADHD stated: "There is no information on the long-term outcomes of medication-treated ADHD individuals in terms of educational and occupational achievements, involvement with the police, or other areas of social functioning." Another review of the research stated: "The major effect of the stimulants appears to be an improvement in classroom manageability rather than academic performance."

Harold A. Scarbro
Las Vegas, Nevada

In "The Wholesale Sedation of America's Youth," I didn't see the type of balanced discussion I was expecting. Recently, Gigerenzer et al. (*Psychological Science in the Public Interest*, 8(2), 53-96. 2008) emphasized the importance of statistical literacy in judging health screening and treatment. Essentially, they defined statistical literacy in this area as understanding that there is no certainty and no zero-risk (only risks that are more or less acceptable) and that consumers of medical services need to ask about the magnitudes of the benefits and harms (absolute, not relative) of treatments.

Weiss unrelentingly leaves the impression

that there are zero treatment benefits. I find this hard to believe. The failure of Weiss to balance his article creates the possibility that readers who have a child who needs treatment will withhold treatment. Furthermore, it appears that Weiss misrepresented the results of the MTA Cooperative Group (1999)—"Alternative, less invasive treatments . . . were found to be at least as effective as medication [in reducing ADHD symptoms] (Weiss, p. 33). The abstract of that study stated: "Our combined treatment did not yield significantly greater benefits than medication management for core ADHD symptoms," making his scholarship suspect. Readers should take a skeptical attitude toward this article.

James R. Lewis
Delray Beach, Florida

Andrew Weiss' wrong-headed article is better suited for an alternative medicine publication then for the SKEPTICAL INQUIRER. It takes us back to the days of Bruno Bettelheim, who blamed autism on "refrigerator mothers." Weiss assigns the blame to "poor home managers, guardians with insufficient skills, or neglectful caretakers." This cruel and mean-spirited assessment disregards all that has been learned about spectrum disorders this last half-century.

This article is replete with faulty and unsupported assertions. Weiss says sixty years ago it was virtually impossible for a child to be considered mentally ill. I'm sure he remembers when some children showed behavior that was unintentionally bizarre and were bullied, teased, and friendless. In those days the reasons were not known, the diagnoses were not developed. Evidently Weiss thinks these were simply bad kids, products of bad parents, and too bad for them. Today, although there is still much to be learned, often successful efforts, including medicine, are being made to help these children.

Weiss claims that "alternative, less invasive treatments…like, nutritional treatments, early intervention, and teacher and parent training programs" are equally effective as medication. Early intervention and teacher and parent training programs (generally accompanied with medication) are indeed today considered to be helpful, but nutritional treatments are complete quackery.

Surely Weiss is right when he deplores the abuse of medications and the greed of some practitioners, but this is no reason to condemn progress and go back to the days of Freudian dogma.

Marvin J. Schissel
Roslyn Heights, New York

The only expertise—if that is what it can be called—I can offer relating to the subject of "The Wholesale Sedation of America's Youth" is that I have lived with Attention Deficit Disorder (ADD—not ADHD) for sixty years. I do firmly believe that there is a real neurological disorder with the characteristics that are usually ascribed to ADD/ADHD. After reading the first book we purchased on ADD (*The Hyperactive Child, Adolescent, and Adult: Attention Deficit Disorder Through the Lifespan* by Dr. Paul Wender), I remarked to my wife that it was as if I had just read my own biography. Virtually all the common characteristics noted by Dr. Wender were very familiar facets of my life.

I can tell you that, at least in my case, medication and counseling saved my life, my marriage, my self-esteem, and my happiness. And, no, counseling alone would not have been enough.

I clearly recall the first day that I went on Ritalin. I picked up the prescription at our pharmacy at lunchtime and immediately took my first dose. Later in the day, my wife called me at work to see how I was doing. We were both concerned about how the Ritalin would affect me. I told her that the only thing I had noticed was that the day was going more smoothly than usual. And that turned out to be the pattern for all the years to come. The days went more smoothly, much less stressfully, and more effectively than on the days when I missed my dosages.

I do not doubt that the drug companies have a vested interest in getting such medications prescribed as often as possible. I also agree that there are parents, doctors, and teachers who see medications as a quick fix. I also firmly believe—as does my wife, who is a retired first grade teacher (and very familiar with ADD because of her husband)—that there are many children out there who truly need and have not yet received the benefits that such medications can provide. My wife has seen many children who have had severe learning, attention, social, and discipline problems in the classroom, and it has been lost time for them—time that can never be gotten back. If a proper diagnosis is not made early and help given, then those problems can have lasting effects throughout their lives.

Medical science has progressed greatly since I was born in 1948, when many illnesses were unidentified or untreatable. Just because they were unknown in 1948 does not mean that the illnesses did not exist then. The great expansion of recognized neurological and psychiatric diagnoses since 1952 does not necessarily have a sinister meaning. It may mean that we know more about the human brain and all the possible things that can go wrong in it. The brain is the most complex organ in the human body. Surely it is reasonable to assume that it has the greatest potential for dysfunction.

Yes, skepticism and caution should always be applied to any aspect of our lives, especially our health. But the potential for abuse and opportunism should be weighed carefully against the potential for real benefit. Unbalanced skepticism can unjustly cast a dark cloud over something good.

Michael Carl Eaton
West Valley City, Utah

As a clinical psychologist who possesses neither the medical training nor the legal qualifications to prescribe, Andrew Weiss clearly has a sizable axe to grind. But, while he repeatedly calls for scientific rigor in determining the safety and effectiveness of psychiatric medications, his arguments rely on innuendo, generalizations, and unfounded accusations. He quotes the FDA's warnings about increases in so-called "suicidality" in children and adolescents treated with antidepressants but offers no explanation of the term "suicidality." Does it refer to actual suicides, attempts, verbalizations, or merely thoughts about suicide? Weiss neglects to mention that since the number of antidepressants prescribed for adolescents has plummeted in response to the FDA warnings, the actual number of adolescent suicides has *increased* dramatically.

Weiss charges that "cash payments, stock options, paid junkets, no-work consultancies, and other inducements encouraged physicians to relax their natural caution about medicating children." Where is his proof? Again, Weiss is quick to accuse without offering hard evidence. In twenty-three years as a board-certified psychiatrist, I have never been offered any of the alleged financial inducements to prescribe that Weiss mentions.

Weiss's final sin is to echo those right-wing pundits who accuse parents of children with ADHD of being "too lazy to discipline their kids instead of drugging them." Has he never observed a child with ADHD unable to sit still for a moment, jumping from topic to topic, interrupting others repeatedly, and exploding with rage at the slightest frustration? This is not, as Weiss implies, the "nor-

mal childhood" of half a century ago. I hope that his angry diatribe will not discourage parents with seriously disturbed children from seeking the treatment that might offer them their only chance at a normal life.

Richard S. Schloss, MD
Huntington, New York

The November/December SKEPTICAL INQUIRER was a conversation among unrelated articles. Edzard Ernst asks: "Unproven or Disproven treatments—Why Would Anyone Want to Use Them?" Andrew Weiss provides one of the answers in "The Wholesale Sedation of America's Youth."

The unfortunate truth is that so-called proven treatments are often more marketing hype than science. Weiss unveils the true story of how the pharmaceutical companies have turned childhood into a disease and shamelessly promote putting kids on drugs for behavior that used to simply get them sent to their room. But one telltale sentence applies across many aspects of modern medicine. Weiss says, "Patients were not active participants in a collaborative treatment, they were passive recipients of symptom-reducing substances." That sums up where the pharmaceuticals and medical technology and device manufacturers have pushed modern allopathic medicine. People crave to be active participants in a collaborative strategy to improve their health, and that is what many alternative and complementary providers offer.

As to the effectiveness of treatments—even FDA approval doesn't assure that. Recently a study published in the *New England Journal of Medicine* concluded: "Arthroscopic surgery for osteoarthritis of the knee provides no additional benefit to optimized physical and medical therapy. (Kirkley, A., et al. *NEJM* 359: 1169–1170).This is, in fact, the second peer-reviewed study demonstrating this (the first was published by *NEJM* in 2002: Mosely, J.B. et al. *NEJM* 347: 1717–1719). Yet thousands of these operations are performed every year, and the performing surgeons shrug and claim their patients are always helped. They can offer testimonials.

The alternative and complementary treatments rely pretty heavily on the placebo effect, and as SKEPTICAL INQUIRER letter writer Lucinda Sykes, MD, so aptly stated (same issue), "I support my patients' placebo response at every opportunity. Any practical intervention that encourages a patient's natural capacity to heal and combat disease is welcome, especially in the absence of side-effects. . . ."

While it is excellent to keep our skeptical wits about us when we encounter the many so-called alternative and complementary care options, we need to also keep them sharp when the major pharmaceuticals are campaigning to make some trivial life circumstance a treatable disease. Recently, the American Academy of Pediatricians began recommending use of statins for obese children—drugs rather than diet and exercise—a typical medical-pharmacological response. It is possibly even the right response for a small number of high-risk cases. But how long would it be before the Ritalan effect would take hold and instead of a few hundred kids treated with statins to prevent early onset cardiovascular disease, we'd have the whole 16 percent of obese children treated with drugs and probably many more who are just a little chubby?

Over the past twenty years or so, we seem to have allowed the pharmaceutical companies and the medical device manufacturers to define what good medicine means, and that is a mistake. These companies are profit driven and quite in tune with D.J. Palmer's philosophy, "The world is your cow—but you must do the milking." We need to bring the science and the art of healing together and engage each individual in his or her own health. That's where healing really happens.

Bob Veitch
Minneapolis, Minnesota

Author Andrew Weiss replies to the James Lewis letter:

I did not state that the MTA Cooperative Group's findings proved the superiority of alternative treatments. I merely stated that less invasive treatments were "at least as effective as medication." As I understand the MTA summary, combined (non-medication) treatments were not significantly better than medication—but they were not inferior either. That would suggest that they were "at least as effective."

Weiss replies to the Richard Schloss letter:

A December 31, 2008, article in The New York Times *addressed the issue of pharmaceutical company payments to physicians and put the amount spent annually at 6 billion dollars. In that article, Dr. Phillip Freeman, a psychiatrist in Boston, is quoted as saying that physicians who contended that the giveaways were benign might be suffering from denial.*

Moral Panics

I am in strong sympathy with the point of view expressed by Erich Goode in his article "The Skeptic Meets Moral Panic" (November/December 2008). However, he fails to note that one possible source of moral panic is simply the dramatic quality of the narrative, which is especially important in dealing with panics that are exaggerations of real facts rather than those rooted in complete fiction.

I am sure Mr. Goode is correct in asserting that the overall rate of school violence has declined. But are we making much ado about absolutely nothing? Regardless of the overall sweeping statistics, it remains the case that the Columbine massacre is the deadliest ever in terms of death toll at an American high school in history, and the fourth deadliest at any school or college in American history (the worst remains the Bath School massacre at an elementary school in 1927). Statistically, it may very well be a "spike" in a lowering curve, but it's a record-high spike all the same. The resulting moral panic aimed at the Internet, Goth culture, and prescription psychotropic drugs is a regrettable sign of a hysteria-driven approach to the problem.

Nonetheless, Mr. Goode errs in simply blaming a sensationalistic media for the problem.

Jonathan Harvey
FisherKing@watchersdiary.com

Premature Hope?

Martin Gardner, in his excellent article "Mr. Belloc Objects" (SI November/December 2008), expresses the hope that "The (Catholic) Church is moving slowly and cautiously in the liberal direction" regarding evolution. This hope may be premature.

The current Pope Benedict seems to be rolling back on that position. At his inauguration he said, "We are not the accidental product, without meaning, of evolution."

The director of the Vatican Observatory under Pope John Paul II, Father George Coyne, criticized Cardinal Schonborn of Austria for advocating the teaching of ID. Father Coyne has since been removed from his position. For more details see www.guardian.co.uk/science/2006/aug/28/religion.pope.

Derek Rafter
Navan, County Meath
Ireland

Dembski vs. Berlinski

A minor flub in Gardner's look at H.G. Wells v. Belloc (SI November/December 2008) identified David Berlinski as "a conservative Baptist" when he meant William Dembski. Easy mistake: both orbit the Discovery Institute and (with Behe) advised Ann Coulter (I jousted a few years ago with the pair over some "Godless" postings at TalkReason.org, reprised on Panda's Thumb).

While Berlinski is not above Kulterkampf anti-atheist apologetics in his current book, *The Devil's Delusion*, the lack of a Dembski-style theological drive tells far more about the root cognitive problem. The same is true of the equally secular catastrophist antievolutionism of British Mensa editor Richard Milton.

People cannot readily believe things that aren't true (from Flood Geology to Roswell aliens) unless they manifest Matthew Harrison Brady Syndrome. Per the *Inherit the Wind* avatar of William Jennings Bryan, this is the natural aptitude for not thinking about things they don't think about (and a parallel inability to think very well about what they do think about).

Creationists are an obvious instance of MHBS, but nothing precludes their belief in things that are true too. Such people would be cut more methodological slack than they might deserve due to their flying below the "gosh that's a silly belief" radar. Thus the Wells-Belloc fracas may be more a case of differential MHBS activity than science v. religion.

James Downard
Spokane, Washington

In "Mr. Belloc Objects," Martin Gardner doubly errs in including David Berlinski, described as "a conservative Baptist," in the list of intelligent design creationists he provides. First, Berlinski describes himself as a secular Jew, and second, although he frequently expresses skepticism about Darwinian evolution through natural selection, he is on record as also expressing skepticism about intelligent design, especially in his typically euphuistic "Has Darwin Met His Match?" (*Commentary*, December 2002). Gardner is probably confusing him with William Dembski, the chief theoretician of intelligent design creationism, who is presently research professor in philosophy at Southwestern Baptist Theological Seminary. The confusion is understandable to a degree, since both men, as well as Michael Behe, were thanked for their assistance with the antievolution portion of Ann Coulter's *Godless*.

Glenn Branch
National Center for Science Education
Oakland, California

End of Theory?

The contentious article "No More Theory in Science?" by Massimo Pigliucci (SI, November/December 2008, pp. 23–24) brings to mind the controversial essay published by behavioral psychologist B.F. Skinner back in 1961, "Are Theories of Learning Necessary?" in *Cumulative Record*, Appleton-Century-Crofts, Inc., 36–39. Now Chris Anderson's July 2008 article in *Wired*, "The End of Theory: The Data Deluge Makes the Scientific Method Obsolete" citing the "petabyte age" reinforces Skinner's older skepticism. Yet the operational meaning of theory as such is in question.

What is a theory? An encompassing analysis of categories of theories is found in Ernest Nagel's (1961) chapter, "The Cognitive Status of Theories" in his book *The Structure of Science*, Harcourt, Brace and World, Inc., 106–152. Nagel's analysis places the term theory in a multivariate perspective. That is, Nagel defines three types of theories, viz., realist, descriptive, and instrumental. In the *realist* view, terms proposed in theories refer to things as real as "sticks and stones," even when these terms are not readily observable, for example, as in cognitive dissonance. Comparatively, the *descriptive* view asserts that theories are "a complex of observable events" encompassing relationships between them, i.e., "a summary description." And lastly, the *instrumentalist* view of theories emphasizes the use of a "rule or guide for making logical transitions from one set of experimental data to another set," with prediction serving as the litmus test for success.

Judging from Nagel's interpretation, then, Anderson, like Skinner, is utilizing the descriptive view of theories. That is, while Anderson rejects the conventional use of theory, his *Wired Magazine* article takes the level of descriptive theory even closer to raw data than Skinner's operant conditioning. Both Anderson and Skinner are logical positivists in the philosophical sense, emphasizing the necessary and, in Anderson's case, sufficient role of empirical data. Anderson, equipped with the modern advantage of computer technology, sees how cluster analyses of masses of data may reveal patterns of correlated relationships not unlike findings seen in factor analysis. Granted, the researcher must ultimately name the factors.

Perhaps these descriptive writers see theory couched within the skeptical world of the British empiricist David Hume, viz., that all relationships between events are at best correlational in terms of the human capacity to understand them; i.e., causation is in the mind of the beholder. Tentatively, then, both Skinner's and Anderson's descriptive views of theory may be all that is humanly possible.

William F. Vitulli, PhD
Professor Emeritus of Psychology
University of South Alabama
Mobile, Alabama

Street Lights Go On and Off

I read with interest the column "The Curious Case of Street Lamp Interference" (November/December 2008). This has happened to me several times but this is the first time I have heard of it happening to anyone else. In my case, I am in my car approaching a street light and the light goes off just when I reach it. In one memorable early morning, four lamps went off in a row as my car approached. They didn't go off at the same time, but each time I reached a lamp that one would turn off and then when I got near the next one that one turned off, etc. What came to my mind was that the lamps probably have light-sensing devices that turn them off automatically when enough light is detected. Since it was the early morning, the light was starting to be discernable. Whether or not my approaching car caused this is unknown. Nevertheless, it was an eerie experience.

Robert Menchaca
Hayward, California

The letters column is a forum for views on matters raised in previous issues. **Letters should be no longer than 225 words.** Due to the volume of letters we receive, not all can be published. Send letters as e-mail text (not as attachments) to letters@csicop.org. In the subject line, provide an informative identification, e.g.: "Letter re: Jones evolution article." Include your name and address at the end of the letter. You may also mail your letter to the editor to 944 Deer Dr. NE, Albuquerque, NM 87122, or fax it to 505-828-2080.

COMMITTEE FOR SKEPTICAL INQUIRY

Scientific and Technical Consultants

Gary Bauslaugh, editor, *Humanist Perspectives*, Victoria, B.C., Canada
Richard E. Berendzen, astronomer, Washington, D.C.
Martin Bridgstock, Senior Lecturer, School of Science, Griffith University, Brisbane, Australia
Richard Busch, magician/mentalist, Pittsburgh, Penn.
Shawn Carlson, Society for Amateur Scientists, East Greenwich, RI
Roger B. Culver, professor of astronomy, Colorado State Univ.
Felix Ares de Blas, professor of computer science, University of Basque, San Sebastian, Spain
Michael R. Dennett, writer, investigator, Federal Way, Washington
Sid Deutsch, engineering consultant, Sarasota, Fla.
J. Dommanget, astronomer, Royale Observatory, Brussels, Belgium
Nahum J. Duker, assistant professor of pathology, Temple University
Taner Edis, Division of Science/Physics Truman State University
Barbara Eisenstadt, psychologist, educator, clinician, East Greenbush, N.Y.
William Evans, professor of communication, Center for Creative Media
Bryan Farha, professor of behavioral studies in education, Oklahoma City Univ.
John F. Fischer, forensic analyst, Orlando, Fla.
Eileen Gambrill, professor of social welfare, University of California at Berkeley
Luis Alfonso Gámez, science journalist, Bilbao, Spain
Sylvio Garattini, director, Mario Negri Pharmacology Institute, Milan, Italy
Laurie Godfrey, anthropologist, University of Massachusetts
Gerald Goldin, mathematician, Rutgers University, New Jersey
Donald Goldsmith, astronomer; president, Interstellar Media
Alan Hale, astronomer, Southwest Institute for Space Research, Alamogordo, New Mexico
Clyde F. Herreid, professor of biology, SUNY, Buffalo
Terence M. Hines, professor of psychology, Pace University, Pleasantville, N.Y.
Michael Hutchinson, author; SKEPTICAL INQUIRER representative, Europe
Philip A. Ianna, assoc. professor of astronomy, Univ. of Virginia
William Jarvis, professor of health promotion and public health, Loma Linda University, School of Public Health
I.W. Kelly, professor of psychology, University of Saskatchewan
Richard H. Lange, M.D., Mohawk Valley Physician Health Plan, Schenectady, N.Y.
Gerald A. Larue, professor of biblical history and archaeology, University of So. California
William M. London, California State University, Los Angeles
Rebecca Long, nuclear engineer, president of Georgia Council Against Health Fraud, Atlanta, Ga.
Thomas R. McDonough, lecturer in engineering, Caltech, and SETI Coordinator of the Planetary Society
James E. McGaha, astronomer, USAF pilot (ret.)
Chris Mooney, journalist, author, Washington correspondent, *SEED* Magazine
Joel A. Moskowitz, director of medical psychiatry, Calabasas Mental Health Services, Los Angeles
Jan Willem Nienhuys, mathematician, Univ. of Eindhoven, the Netherlands
Matthew C. Nisbet, assistant professor, School of Communication, American University
John W. Patterson, professor of materials science and engineering, Iowa State University
Massimo Pigliucci, professor in Ecology & Evolution at SUNY-Stony Brook, NY
James R. Pomerantz, professor of psychology, Rice University
Gary P. Posner, M.D., Tampa, Fla.
Daisie Radner, professor of philosophy, SUNY, Buffalo
Robert H. Romer, professor of physics, Amherst College
Karl Sabbagh, journalist, Richmond, Surrey, England
Robert J. Samp, assistant professor of education and medicine, University of Wisconsin-Madison
Steven D. Schafersman, asst. professor of geology, Miami Univ., Ohio
Chris Scott, statistician, London, England
Stuart D. Scott, Jr., associate professor of anthropology, SUNY, Buffalo
Erwin M. Segal, professor of psychology, SUNY, Buffalo
Carla Selby, anthropologist/archaeologist
Steven N. Shore, professor and chair, Dept. of Physics and Astronomy, Indiana Univ. South Bend
Waclaw Szybalski, professor, McArdle Laboratory, University of Wisconsin–Madison
Sarah G. Thomason, professor of linguistics, University of Pittsburgh
Tim Trachet, journalist and science writer, honorary chairman of SKEPP, Belgium
David Willey, physics instructor, University of Pittsburgh

United States

ALABAMA. Alabama Skeptics, Alabama. Emory Kimbrough. Tel.: 205-759-2624. 3550 Watermelon Road, Apt. 28A, Northport, AL 35476 US.

ARIZONA. Tucson Skeptics Inc. Tucson, AZ. James McGaha. E-mail: JMCGAHA@PimaCC.Pima.EDU. 5100 N. Sabino Foothills Dr., Tucson, AZ 85715 US. **Phoenix Skeptics**, Phoenix, AZ. Michael Stackpole, P.O. Box 60333, Phoenix, AZ 85082 US.

CALIFORNIA. Sacramento Organization for Rational Thinking (SORT) Sacramento, CA. Ray Spangen-burg, co-founder. Tel.: 916-978-0321; e-mail: kitray@quiknet.com. PO Box 2215, Carmichael, CA 95609-2215 US. www.quiknet.com/~kitray/index1.html. **Bay Area Skeptics** (BAS) San Francisco—Bay Area. Tully McCarroll, Chair. Tel.: 415 927-1548; e-mail: tullyann@pacbell.net. PO Box 2443 Castro Valley, CA 94546-0443 US. www.BASkeptics.org. **Independent Investigations Group (IIG),** Center for Inquiry–*West*, 4773 Hollywood Blvd, Los Angeles, CA 90027 Tel.; 323-666-9797 ext. 159; Web site:www.iigwest.com. **Sacramento Skeptics Society**, Sacramento. Terry Sandbek, President. 4300 Auburn Blvd. Suite 206, Sacramento CA 95841. Tel.: 916 489-1774. E-mail: terry@sandbek.com. **San Diego Association for Rational Inquiry** (SDARI) President: Paul Wenger. Tel.: 858-292-5635. Program/general information 619-421-5844. Web site: www.sdari.org. Postal address: PO Box 623, La Jolla, CA 92038-0623.

COLORADO. The Denver Skeptics Meetup Group. Elaine Gilman, President. Skype address: elaine.gilman. 965 S. Miller Street, 302, Lakewood, CO 80226. Web site: http://skeptics.meetup.com/131/.

CONNECTICUT. New England Skeptical Society (NESS) New England. Steven Novella M.D., President. Tel.: 203-281-6277; e-mail: board@theness.com. 64 Cobblestone Dr., Hamden, CT 06518 US. www.theness.com.

D.C./MARYLAND. National Capital Area Skeptics NCAS, Maryland, D.C., Virginia. D.W. "Chip" Denman. Tel.: 301-587-3827. e-mail: ncas@ncas.org. PO Box 8428, Silver Spring, MD 20907-8428 US. http://www.ncas.org.

FLORIDA. Tampa Bay Skeptics (TBS) Tampa Bay, Florida. Gary Posner, Executive Director. Tel.: 813-849-7571; e-mail: tbs@cfiflorida.org; 5201 W. Kennedy Blvd., Suite 124, Tampa, FL 33609 US. www.tampabayskeptics.org. **The James Randi Educational Foundation.** James Randi, Director. Tel: (954)467-1112; e-mail jref@randi.org. 201 S.E. 12th St. (E. Davie Blvd.), Fort Lauderdale, FL 33316-1815. Web site: www.randi.org.

IOWA. Central Iowa Skeptics (CIS) Central Iowa, Rob Beeston. Tel.: 515-285-0622; e-mail: ciskeptics@hotmail.com. 5602 SW 2nd St. Des Moines, IA 50315 US. www.skepticweb.com.

ILLINOIS. Rational Examination Association of Lincoln Land (REALL) Illinois. Bob Ladendorf, Chairman. Tel.: 217-546-3475; e-mail: chairman@reall.org. PO Box 20302, Springfield, IL 62708 US. www.reall.org.

KENTUCKY. Kentucky Assn. of Science Educators and Skeptics (KASES) Kentucky. 880 Albany Road, Lexington, KY 40502. Contact Fred Bach at e-mail: fredwbach@yahoo.com; Web site www.kases.org; or (859) 276-3343.

LOUISIANA. Baton Rouge Proponents of Rational Inquiry and Scientific Methods (BR-PRISM) Louisiana. Marge Schroth. Tel.: 225-766-4747. 425 Carriage Way, Baton Rouge, LA 70808 US.

MICHIGAN. Great Lakes Skeptics (GLS) SE Michigan. Lorna J. Simmons, Contact person. Tel.: 734-525-5731; e-mail: Skeptic31@aol.com. 31710 Cowan Road, Apt. 103, Westland, MI 48185-2366 US. **Tri-Cities Skeptics**, Michigan. Gary Barker. Tel.: 517-799-4502; e-mail: barkerg@svol.org. 3596 Butternut St., Saginaw, MI 48604 US.

MINNESOTA. St. Kloud Extraordinary Claim Psychic Teaching Investigating Community (SKEPTIC) St. Cloud, Minnesota. Jerry Mertens. Tel.: 320-255-2138; e-mail: gmertens@stcloudstate.edu. Jerry Mertens, Psychology Department, 720 4th Ave. S, St. Cloud State University, St. Cloud, MN 56301 US.

MISSOURI. Skeptical Society of St. Louis (SSSL) St. Louis, Missouri. Michael Blanford, President. E-mail: info@skeptricalstl.org. 2729 Ann Ave., St. Louis, MO 63104 US. www.skepticalstl.org.

NEVADA. Skeptics of Las Vegas, (SOLV) PO Box 531323, Henderson, NV 89053-1323. E-mail: rbanderson@skepticslv.org. Web site: www.skepticslv.org./.

NEW MEXICO. New Mexicans for Science and Reason (NMSR) New Mexico. David E. Thomas, President. Tel.: 505-869-9250; e-mail: nmsrdave@swcp.com. PO Box 1017, Peralta, NM 87042 US. www.nmsr.org.

NEW YORK. New York Area Skeptics (NYASk) metropolitan NY area. Jeff Corey, President. 18 Woodland Street, Huntington, NY 11743, Tel: (631) 427-7262 e-mail: jcorey@liu.edu, Web site: www.nyask.com. **Inquiring Skeptics of Upper New York** (ISUNY) Upper New York. Michael Sofka, 8 Providence St., Albany, NY 12203 US. **Central New York Skeptics** (CNY Skeptics) Syracuse. Lisa Goodlin, President. Tel: (315) 446-3068; e-mail: info@cnyskeptics.org, Web site: cnyskeptics.org 201 Milnor Ave., Syracuse, NY 13224 US.

OHIO. Central Ohioans for Rational Inquiry (CORI) Central Ohio. Charlie Hazlett, President. Tel.: 614-878-2742; e-mail: charlie@hazlett.net. PO Box 282069, Columbus OH 43228 US. **South Shore Skeptics** (SSS) Cleveland and counties. Jim Kutz. Tel.: 440 942-5543; e-mail: jimkutz@earthlink.net. PO Box 5083, Cleveland, OH 44101 US. www.southshoreskeptics.org/. **Association for Rational Thought** (ART) Cincinnati. Roy Auerbach, president. Tel: 513-731-2774, e-mail: raa@cinci.rr.com. PO Box 12896, Cincinnati, OH 45212 US. www.cincinnati skeptics.org.

OREGON. Oregonians for Science and Reason (O4SR) Oregon. Jeanine DeNoma, president. Tel.: (541) 745-5026; e-mail: wilkinsa@peak.org; 39105 Military Rd., Monmouth, OR 97361 US. Web site: www.04SR.org.

PENNSYLVANIA. Philadelphia Association for Critical Thinking (PhACT), much of Pennsylvania. Eric Krieg, President. Tel.: 215-885-2089; e-mail: erickrieg@verizon.net. By mail C/O Ray Haupt 639 W. Ellet St., Philadelphia PA 19119.

TENNESSEE. Rationalists of East Tennessee, East Tennessee. Carl Ledenbecker. Tel.: 865-982-8687; e-mail: Aletall@aol.com. 2123 Stonybrook Rd., Louisville, TN 37777 US.

TEXAS. North Texas Skeptics NTS Dallas/Ft Worth area, John Blanton, Secretary. Tel.: 972-306-3187; e-mail: skeptic@ntskeptics.org. PO Box 111794, Carrollton, TX 75011-1794 US. www.ntskeptics.org.

VIRGINIA. Science & Reason, Hampton Rds., Virginia. Lawrence Weinstein, Old Dominion Univ.-Physics Dept., Norfolk, VA 23529 US.

WASHINGTON. Society for Sensible Explanations, Western Washington. Tad Cook, Secretary. E-mail: K7RA@arrl.net. PO Box 45792, Seattle, WA 98145-0792 US. http://seattleskeptics.org.

PUERTO RICO. Sociedad De Escépticos de Puerto Rico, Luis R. Ramos, President. 2505 Parque Terra Linda, Trujillo Alto, Puerto Rico 00976. Tel: 787-396-2395; e-mail: Lramos@escepticospr.com; Web site www.escepticor.com.

International groups listings have been moved to our Web site: **www.csicop.org**

The organizations listed above have aims similar to those of the Committee for Skeptical Inquiry but are independent and autonomous. Representatives of these organizations cannot speak on behalf of CSI. Please send updates to Barry Karr, P.O. Box 703 Amherst NY 14226-0703.

CENTERS FOR INQUIRY

www.centerforinquiry.net/about/centers

TRANSNATIONAL
3965 Rensch Road, Amherst, NY 14228
Tel.: (716) 636-4869

AUSTIN
PO Box 202164, Austin, TX 78720-2164
Tel.: (512) 919-4115

CHICAGO
PO Box 7951, Chicago, IL 60680-7951
Tel.: (312) 226-0420

INDIANAPOLIS
350 Canal Walk, Suite A, Indianapolis, IN 46202
Tel.: (317) 423-0710

MICHIGAN
3777 49th Street SE, Grand Rapids, MI 49512
Tel.: (616) 698-2342

NEW YORK CITY
80 Broad Street, 5th Floor, New York, NY 10004
Tel.: (212) 504-2945

SAN FRANCISCO
E-mail: sf@centerforinquiry.net

TAMPA
5201 West Kennedy Blvd., Suite 124, Tampa, FL 33609
Tel.: (813) 849-7571

WASHINGTON, DC
621 Pennsylvania Ave. SE, Washington, DC 20003
Tel.: (202) 546-2330

WEST
4773 Hollywood Blvd., Hollywood, CA. 90027
Tel.: (323) 666-9797

ARGENTINA
Av. Santa Fe 1145 - 2do piso, (C1059ABF)
Buenos Aires, Argentina
Tel.: +54-11-4811-1858

CHINA
China Research Institute for Science
Population, NO. 86, Xueyuan Nanlu Haidian Dist., Beijing, 100081 China
Tel.: +86-10-62170515

EGYPT
44 Gol Gamal St., Agouza, Giza, Egypt

FRANCE
Dr. Henri Broch, Universite of Nice, Faculte des Sciences, Parc Valrose, 06108, Nice cedex 2, France
Tel.: +33-492-07-63-12

GERMANY
Kirchgasse 4, 64380 Rossdorf, Germany
Tel.: +49-6154-695023

INDIA
A 60 Journalist colony, JubileeHills, Hyderabad-500033, India
Tel.: +91-40-23540676

LONDON
Conway Hall, 25 Red Lion Square, London WC1R 4RL, England
E-mail: slalvani@centerforinquiry.net

NEPAL
Humanist Association of Nepal, PO Box 5284, Kathmandu Nepal
Tel.: +977-1-4413-345

NEW ZEALAND
E-mail: bcooke@centerforinquiry.net

NIGERIA
PO Box 25269, Mapo, Ibadan, Oyo State, Nigeria
Tel.: +234-2-2313699

ONTARIO
216 Beverley Street, Toronto, Ontario, M5T 1Z3, Canada
Tel.: (416) 971-5676

PERU
D. Casanova 430, Lima 14 Peru
E-mail: cipsiperu@yahoo.com

POLAND
Lokal Biurowy No.8, 8 Sapiezynska Sr., 00-215, Warsaw, Poland

RUSSIA
Dr. Valerii A. Kuvakin, 119899 Russia, Moscow, Vorobevy Gory, Moscow State University, Philosophy Department

SENEGAL
PO Box 15376, Dakar – Fann, Senegal
Tel.: +221-501-13-00